

AD-A100 441

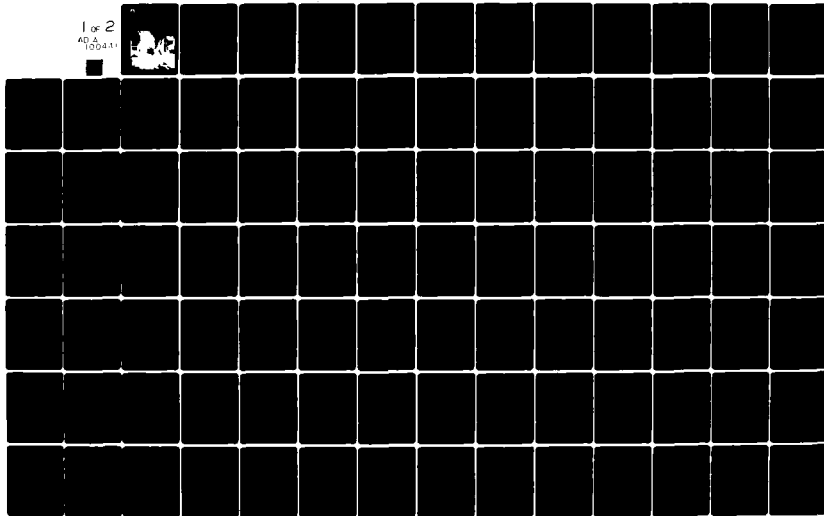
ABELES SCHWARTZ MAECKEL AND SILVERBLATT INC NEW YORK F/G 5/4  
EVALUATION OF ALTERNATIVE MEANS OF IMPLEMENTING SECTION 1362 OF--ETC(U)  
MAR 81 H-2655

UNCLASSIFIED

FEMA-M/R-4

NL

1 of 2  
AD-A  
100441



LEVEL



federal emergency  
management agency  
mitigation & research

13

M & R - 4  
March 1981

# Evaluation of alternative means of implementing Section 1362 of the National Flood Insurance Act of 1968

JUN 19 1981



Adopted and approved

DESIGN AND CONSTRUCTION  
APPROVED FOR THE DISTRICT OF COLUMBIA  
APPROVED FOR THE DISTRICT OF COLUMBIA

8 1 6 15 176

M&R 4 March 1981

Evaluation of Alternative Means of Implementing Section 1362 of the National Flood Insurance Act of 1968

The contents of this report reflect the views of the contractor who is responsible for the facts and the accuracy of the data presented herein, and do not necessarily reflect the official views or policies of the Federal Emergency Management Agency.

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
	AD-A100 441	
4. TITLE (and Subtitle)		5. TYPE OF REPORT & PERIOD COVERED
Evaluation of Alternative Means of Implementing Section 1362 of the National Flood Insurance Act of 1968 (u)		Final Report
7. AUTHOR(s)		6. PERFORMING ORG. REPORT NUMBER
		M&R-4
		8. CONTRACT OR GRANT NUMBER(s)
		H-2655
9. PERFORMING ORGANIZATION NAME AND ADDRESS		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
Joint Venture - Ables, Schwartz, Haekle & Silverblatt, Inc., New York, NY & Ralph M. Field Assoc., Inc., Westport, Conn.		5321A
11. CONTROLLING OFFICE NAME AND ADDRESS		12. REPORT DATE
Federal Emergency Management Agency Mitigation and Research Washington, D.C. 20472		March 1981
		13. NUMBER OF PAGES
		139
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report)
-141 4941		Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report)		
Approved for Public Release; Distribution Unlimited		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)		
(u) Flood Insurance; (u) Flood; (u) Flood Disaster Relief; (u) Disaster Relief; (u) Property Acquisition; (u) Flood Hazard Mitigation; (u) Property Relocation; (u) Floodplain Management		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)		
This study focuses principally on Section 1362 of the National Flood Insurance Act of 1968, undertaking to: (1) identify and explore alternative means for its implementation; (2) estimate the number of structures potentially eligible for purchase under it; (3) identify the effects of Section 1362 on individuals and communities; (4) identify its relation to other federal policies and programs; and (5) estimate the federal costs associated with purchase of flooded properties.		

Full implementation of Section 1362 (a) can provide federal assistance and leadership in reducing flood hazards through acquisition and relocation, thus helping to lessen national flood losses, a goal envisioned in federal flood-related legislation enacted since 1936. Moreover, it can reduce federal flood-related expenditures.

Acquisition under Section 1362 can assist communities to achieve their comprehensive community development goals, while simultaneously making wise use of their floodplains, correcting past mistakes in development, as well as reducing flood losses. Also, 1362 acquisition benefits individuals, chiefly the owners of acquired properties, permitting them to avoid the personal stress, financial and health problems and neighborhood blight associated with hazardous flooding.

Accession For	
NTIS GFAAI	<input checked="checked" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
Distribution/	
Availability Codes	
Avail. and/or	
Dist	1/1/81
A	

Unclassified

FINAL REPORT

131

EVALUATION OF ALTERNATIVE MEANS OF  
IMPLEMENTING SECTION 1362 OF THE  
NATIONAL FLOOD INSURANCE ACT OF 1968

Contract  
H-2655

DTIC  
ELECTE  
JUN 19 1981  
D  
C

Submitted to

Federal Emergency Management Agency  
Office of Mitigation and Research

by the Joint Venture

Abeles, Schwartz, Haeckel & Silverblatt, Inc.  
New York, New York

and

Ralph M. Field Associates, Inc.  
Westport, Conn.

March 1981

## TABLE OF CONTENTS

ACKNOWLEDGMENTS	i
ABSTRACT	ii
LIST OF ABBREVIATIONS	iv
MAJOR FINDINGS	v
I. INTRODUCTION	1
A. PURPOSE OF THE STUDY	2
B. METHODOLOGY	3
II. FLOOD LOSSES AND THE FEDERAL RESPONSE TO FLOODS	5
A. EVOLUTION OF FEDERAL FLOOD POLICY	6
INITIAL PERIOD	
REORIENTATION TOWARD A "UNIFIED NATIONAL PROGRAM"	7
THE NATIONAL FLOOD INSURANCE PROGRAM	9
Changes in the Federal Disaster Relief Act	14
Encouragement of Nonstructural Alternatives	
in the Major Federal Water Resources	
Program	15
Recent Executive Initiatives to Promote	
Nonstructural Flood Protection	16
B. FLOODPLAIN ACQUISITION	17
C. THE ROLE OF SECTION 1362 WITHIN THE NATIONAL FLOOD INSURANCE PROGRAM	20
III. PAST AND PROJECTED INCIDENCE OF PROPERTIES ELIGIBLE FOR ACQUISITION UNDER SECTION 1362	26
A. HISTORICAL PROFILE	28
B. PROJECTED FUTURE INCIDENCE OF CRITICAL PROPERTIES	33
AVERAGE ANNUAL INCIDENCE OF CRITICAL PROPERTIES	33
THREE CONSIDERATIONS AFFECTING THE SCOPE OF CRITICAL PROPERTIES ELIGIBLE FOR ACQUISITION UNDER SECTION 1362	37

Insurance Coverage Requirements	37
Limitation of Section 1362 to Properties Damaged by Presidentially Declared Major Disasters	38
Limitation of Section 1362 to Communities with a Minimum Number of Critical Claims in One Year	39
Synopsis	41
CATASTROPHIC FLOOD YEARS	41
INCIDENCE OF PROPERTIES QUALIFYING FOR ACQUISITION UNDER SECTION 1362 (b)	42
IV. NATIONAL BENEFITS OF THE SECTION 1362 PROGRAM	44
A. NATIONAL ECONOMIC DEVELOPMENT	45
FUTURE INUNDATION REDUCTION BENEFITS OF SECTION 1362	46
LOCATION BENEFITS OF SECTION 1362	49
B. ENVIRONMENTAL QUALITY	50
C. CONTRIBUTIONS TO OTHER NATIONAL GOALS AND PROGRAMS	52
CONTRIBUTIONS TOWARD OTHER NATIONAL POLICY OBJECTIVES	52
National Disaster Relief Policy	52
National Housing Policy	53
CONTRIBUTIONS TO OTHER FEDERAL ACQUISITION PROGRAMS	54
Regular and Emergency Community Development Block Grants	55
Heritage Conservation and Recreation Service & Land and Water Conservation Fund (LAWCON)	55
Fish and Wildlife Service - Fish Restoration and Wildlife Restoration	56
Nonstructural Floodplain Management Programs of the Corps of Engineers (COE) and the Department of Agriculture Soils Conservation Service (SCS) and Farmers Home Administra- tion (FmHA) - Authority under Section 73 of the Water Resources Act of 1974	57



V.	THE NATIONAL COSTS OF THE 1362 PROGRAM	59
A.	CONSIDERATIONS AFFECTING THE COST OF ACQUIRING CRITICAL PROPERTIES	59
	Relocation Benefits Under the Uniform Relo- cation and Property Acquisition Policies Act of 1970 ("Uniform Act")	60
	Basis for Site Payment	62
	Federal Share of Acquisition Costs	63
	Basis for Insurance Payments	64
B.	THE FEDERAL BUDGET OF SECTION 1362 - AVERAGE COST OF ACQUIRING ELIGIBLE PROPERTIES	65
	BUDGET ESTIMATES	68
C.	NATIONAL ECONOMIC DEVELOPMENT COSTS	70
VI.	EFFECT ON INDIVIDUALS AND COMMUNITIES	74
A.	INDIVIDUALS	74
	BENEFITS	74
	COSTS	79
B.	COMMUNITIES	80
	BENEFITS	80
	Benefits to All Communities in the NFIP	80
	Benefits to Communities Directly Participa- ting in an Acquisition Program	81
	Upstream/Downstream Communities	82
	COSTS	82
VII.	THE ADMINISTRATION OF THE 1362 PROGRAM	84
A.	SOME ADMINISTRATIVE FACTORS TO BE CONSIDERED IN IMPLEMENTING SECTION 1362	84
	DEFINITIONS	84
	Concept of Property Value for Determining Critical Damage and Eligibility for Acquisition Under Section 1362	84
	Consistency of Flood Damage Criteria Used for Judging Substantial Improvements and Section 1362 Eligibility	86

Definition of "Flood Risk Area"	81
ACQUISITION OF SCATTERED SITES	87
MOBILE HOMES	89
PLANNING, ACQUISITION AND REUSE	89
Encouragement of Advance Planning for Flooded Property Acquisition	89
Responsibility for Conducting the Actual Property Acquisition, Including Appraisals, Title Searches and Negotiations with Owners	92
Initial Title	92
Lease or Conveyance to State or Local Agencies, if the Federal Government Takes Initial Title	93
Reuses of Property Purchased under Section 1362	94
Mechanism for Imposing Restrictions on Reuse	95
Steps to Monitor Compliance with Restrictions on Reuse	98
Duration of Restrictions	99
IMPLEMENTATION	100
B. HOW WOULD THE 1362 PROGRAM WORK? A PROGRAM SCENARIO REFLECTING THE FINDINGS OF THIS STUDY	100
DISTRIBUTION OF RESPONSIBILITIES AND COSTS	100
ELIGIBILITY REQUIREMENTS	101
IMPLEMENTATION PHASES	102
APPENDICES	
A. SECTION 1362 OF THE NATIONAL FLOOD INSURANCE ACT OF 1968, AS AMENDED	111
B. ABSTRACT OF TASK REPORTS	113
C. BRIEF DESCRIPTIONS OF ACQUISITION PROJECTS	117
D. PROJECTION OF CRITICAL POLICIES	120
E. ESTIMATED REDUCTION OF INUNDATION DAMAGES OF AN AVERAGE SINGLE-FAMILY HOME THROUGH 1967 ACQUISITION	121
LITERATURE CITED	122

## LIST OF TABLES

1	All Agencies - Flood Disaster Relief for Private Sector Summary of Subsidies by Individual Program, FY 72 - 76	12
2	Estimated Reduction of Inundation Damages of an Average Single Family Home through 1362 Acquisition 1979 Values	48
3	Average Cost of Acquiring Eligible Properties by Type of Occupancy and Cost Scenario 1979 Cost Levels	69

## LIST OF FIGURES

1	The Place of the 1362 Program in the Framework of National Flood Loss Reduction and Disaster Assistance Policies	10
2	Percentage of all Federal Flood Disaster Subsidies to the Private Sector by Various Programs	13
3	Projected Annual Rate of Increase of Critical Policies from 1980 through 2000	37
4	Percent of Critical Properties Eligible for Acquisition	41
5	Cost of Acquiring a Weighted Average Critical Property by Cost Scenario	66
6	1362 Budget Estimates by Cost Scenario	70
7	National Economic Development Cost of Acquiring an Average Critical Single-Family Home by Cost Scenario	73
8	The Benefits of Section 1362 to the Owner of an Average Single-Family Home	75

## ACKNOWLEDGMENTS

The Government Technical Representative, Arthur Zeinel, worked with the Joint Venture during the entire course of the study, offering essential guidance and encouragement as well as timely criticism. The enthusiasm, understanding and precise comments of Laurence Foushner of FIA have been most welcome over the last 24 months. Richard Boistvert and James Goddard, consultants to FIA, helped guide the work in several key areas.

For the Joint Venture, Harry Schwartz was the Project Director and Leonard Haackel and Ralph H. Field the Associate Directors. In addition, Mark Parker, Paul Phillips and William Marshall, of Abeles, Schwartz, Haackel and Silverblatt and Stuart Branan, Larry Johnston and Jack Noble of Talpey H. Field and Associates all played major roles in the work. Gen Kusler and Howard Christoffer made major contributions to the study as consultants and Dr. John Doolittle ably directed the computer processing of all the data from the NIE. Diagrams were prepared by Terrie Fisher.

The Joint Venture would also like to thank the many people from federal, state and local agencies and in the private sector who generously gave their time and assistance to the study.

\*\*\*\*\*

## ABSTRACT

This study focuses principally on Section 1362 (a) of the National Flood Insurance Act, undertaking to: (1) identify and explore alternative means for its implementation; (2) estimate the number of structures potentially eligible for purchase under it; (3) identify the effects of Section 1362 on individuals and communities; (4) identify its relation to other federal policies and programs; and (5) estimate the federal costs associated with the purchase of flooded properties.

Experience indicates that structural protection is not feasible nor applicable for a large share of the existing development in the nation's floodplains and that correcting non-conforming uses through regulatory mechanisms is not effective. Therefore, the long-term relief of hazards will require the acquisition and relocation of certain flood prone properties.

There is ample precedent in local experience for reducing flood hazards through the acquisition of property. Many communities in the nation have acquired or attempted to acquire flood prone properties for this purpose.

Full implementation of Section 1362 (a) can provide federal assistance and leadership in reducing flood hazards through acquisition and relocation, thus helping to lessen national flood losses, a goal envisioned in federal flood-related legislation enacted since 1936. Moreover, it can reduce federal flood-related expenditures.

Acquisition under Section 1362 can assist communities to achieve their comprehensive community development goals, while simultaneously making wise use of their floodplains, correcting past mistakes in development, as well as reducing flood losses.

Furthermore, 1362 acquisition benefits individuals, chiefly the owners of acquired properties, permitting them to avoid the personal stress, financial and health problems and neighborhood blight associated with hazardous flooding.

It is estimated that the number of properties that will become eligible and available for acquisition under Section 1362 will rise from 1,600 in 1981 to about 2,000 in the year 2000. In 1979 dollars the federal cost of purchasing these properties would rise from \$21 to \$27 million.

Limited administrative resources at federal and local levels as well as funding may require implementation of the Section 1362 program to proceed on a priority or selective basis for some time.

The program should be carried out in close cooperation with the states and local communities and, for greatest effectiveness, should be closely coordinated with related federal programs.

## LIST OF ABBREVIATIONS

CDBG	Community Development Block Grant Program
COE	U.S. Army Corps of Engineers
Corps	U.S. Army Corps of Engineers
DOL	U.S. Department of Labor
DR&R	Office of Disaster Response and Recovery (formerly FEMA)
EO	Executive Order
PDAA	Federal Disaster Assistance Administration
FEMA	Federal Emergency Management Agency
FIA	Federal Insurance Administration
FMHA	Farmer's Home Administration
HCRS	Heritage Conservation and Recreation Service
HUD	Department of Housing and Urban Development
LAWCON	Land and Water Conservation Fund
NFIP	National Flood Insurance Program
PL	Public Law
SBA	Small Business Administration
SCS	Soil Conservation Service
TVA	Tennessee Valley Authority
WRC	Water Resources Council



## MAJOR FINDINGS

In recent years, more than 200 local communities have acquired or attempted to acquire property located in the floodplain. Some communities have relied primarily on local funds; others were funded through a combination of state and federal programs. Land and Water Conservation Funds and Community Block Grants have been particularly important in this regard. In theory, Section 73 of the Water Resource Development Act of 1974 authorizes 80% federal funding of property acquisition and other non-structural floodplain management projects, but Congress has yet to appropriate funds for acquisition under Section 73.

Although these various programs can be used to acquire property in floodplains, none has as its primary purpose the reduction of flood hazards. In contrast, the only purpose of Section 1362 of the National Flood Insurance Program is the purchase of flood-damaged property when it serves the public interest. This section authorizes the purchase of property seriously damaged by a single flood or damaged less severely by three floods in a five-year period. The public interest can be defined in such a way as to promote public safety by enabling property owners to avoid future flood risk; to facilitate community floodplain management and hazard mitigation; to reduce federal disaster-related expenditures; and to contribute to the supply of needed open space and recreational resources in an area. Section 1362 has an added advantage in that it offers owners of flood-damaged property a financially feasible alternative to repairing a damaged structure at once. Furthermore, lengthy study or project application requirements are not required and assistance is available when it is needed most, immediately following a flood.

The other major findings of the study relate to projections of the numbers of properties eligible for acquisition under Section 1362, budget requirements, impacts on communities and individuals and administrative considerations. They are listed below.

1. One way to estimate the potential contribution of Section 1362 to the National Flood Insurance Program is to see how many properties could have been acquired had Section 1362 been in operation from the inception of the NFIP to date (i.e., January 1970 - June 1979). During this period:
  - a) More than 6,100 structures, mostly single family homes, would have been eligible for acquisition. Over 98% of

them would have become eligible by being substantially damaged in a single flood event. Less than 2% of the eligible structures would have become eligible through repetitive damage.

- b) From January 1970 through June 1979 nearly 1,140 communities nationwide contained properties that would have met the statutory eligibility criteria for acquisition under Section 1362. Approximately 100 of these communities contained 10 or more eligible properties. Nearly 60% of all eligible properties were in communities with 10 or more eligible properties in a single year.
  - c) Nearly 50% of the eligible properties were damaged in a Presidentially declared disaster.
  - d) Eligible properties are distributed somewhat unevenly geographically. Nearly 60% of the properties are in the South, 21% and 15% are in the Northeast and North Central States, respectively, and 6% in the West. This distribution appears to be a function of the overall flood hazard in the regions. There is little evidence to suggest that 1973-79 (the years in which there were sufficient flood insurance policies in force to draw valid conclusions) were years of abnormally serious flooding.
  - e) The eligible properties during this historic period accounted for only 7% of all claims with structure damage, but 23% of the dollar value of all such claims. The dollar value of contents damage was also substantial.
2. Based on the historical percentage of "eligible" claims to policies in force, eligible properties were projected to the year 2000 in relation to projected policies in force. The program is expected to remain modest, in part because new construction in regular program communities is to be above the 100-year flood elevation.
- a) An estimated 1,600 properties are expected to meet the eligibility criteria and be available for acquisition under Section 1362. This figure is expected to increase to about 2,000 properties by the year 2000.
  - b) In constant 1979 dollars, the federal outlays required to purchase eligible and available properties range from \$21 million in 1981 to \$27 million by the 2000. These include administrative costs plus the difference between

the cash value of the structure and an insurance payment based on the determination of a total loss and a land payment based on the cost of a comparable site outside the floodplain.

- c) Although one would expect the proportion of total eligible properties due to repetitive damage would rise the longer the program is in operation, it is not anticipated that they will ever account for a major share of all eligible properties.
3. These budget estimates are based on the assumption that all eligible and available properties are purchased. However, many of the historical properties are scattered and many communities contain only one or two of them. Although, in many cases the purchase of scattered properties may be justified, in order to maximize the future hazard mitigation potential and to take full advantage of open space benefits, FEMA may want to give priority to communities with 10 or more eligible properties in the same year or to communities where Presidential disasters are declared. Budget estimates would be modified accordingly.
4. Past acquisition efforts have often made use of a combination of funding sources. The study indicates that communities should be encouraged to combine "1362" acquisition funds with other funds to help obtain sizable tracts of land for open space reuse.
5. Administratively, there are probably several ways to finance the actual acquisition of flood-damaged properties. Some funds will need to be appropriated each year, but because of the fluctuations in flood damages from year to year, it is estimated that up to five times the projected annual outlays might be needed in years of catastrophic floods. The need to obtain special appropriations can be reduced by reimbursing eligible property owners on the basis of constructive total loss, wherever possible.
6. Although there appears to be no basis for requiring local cost-sharing for "1362" acquisition, federal costs could be reduced if local governments were asked to bear their own administrative costs, and where a Presidential disaster declaration has not been made, the costs of demolition and site clearance.
7. To the extent permitted by law, the direct acquisition by

states and local governments (rather than federal purchase followed by a transfer of title to states or localities) would also save some administrative costs.

8. Because the program involves voluntary sales by the homeowner, the success of the program depends on the well-being of the homeowner, after acquisition and relocation. This situation is complicated by the fact that many eligible properties were valued well below the average market value in the surrounding area. Therefore, payments equal to the market value of property less insurance payments may not be sufficient to allow homeowners to purchase comparable housing outside of the floodplain. Since Section 1362 will only serve the public interest if owners of eligible properties move out of the floodplain and since the loss of land value cannot be protected under the flood insurance policy, land payments under Section 1362 may best be based on the cost of land outside the floodplain.
9. During the case studies, local officials were not completely enthusiastic about perpetual open space restrictions because of the potential loss in taxes and other revenues. However, unless the flood hazard were to be eliminated in the future, anything less than perpetual open space use would not be in the interest of flood hazard mitigation.

## I. INTRODUCTION

Sections 1362 (a) and (b) of the National Flood Insurance Act of 1968, as amended, authorize the Director of the Federal Emergency Management Agency (FEMA), when it is determined that the public interest would be served, to purchase certain insured properties located in flood risk areas from willing owners and to transfer them to states or localities for federally acceptable purposes. To qualify for purchase properties must have been damaged substantially beyond repair by floods or other causes, or damaged by floods on not more than three previous occasions in five years with a damage-to-value ratio averaging at least 25%.

Authorized by the National Flood Insurance Act, Section 1362 was designed to work in conjunction with the National Flood Insurance Program (NFIP). Hence, the "public interest" to be served by Section 1362 acquisition is best defined in the context of the NFIP as well as broader federal floodplain management policies. Actions advancing the public interest in this context include: (1) reducing the federal flood insurance subsidy; (2) contributing to the broad local acceptance and enforcement of the floodplain management provisions of the NFIP; (3) contributing to the implementation of Executive Order 11988, Floodplain Management; or (4) promoting the general health, safety and welfare by reducing the exposure of people to severe flood risk.

Although it has long been recognized that the acquisition of severely flood damaged properties can yield broad public benefits, Section 1362 remained unimplemented through the 1970's. Congress appropriated the first funds for the program for Fiscal Year 1980. The main subject of this study is the acquisition of flooded property under Section 1362 (a). Acquisition of property damaged by other natural causes or fires under Section 1362 (b), as authorized by the amendments to the NFIP included in the Housing and Community Development Act of 1977, is considered only a complementary program element to flooded property purchase.

The Housing and Community Development Act of 1977 also added to the acquisition powers of Section 1362 a new sub-section (c) authorizing low interest loans for elevating damaged, insured single-family homes located in certain areas of extremely high

flood risk.\* This new sub-section is not addressed in this report since it presents several problems of consistency with the floodplain management objectives of the National Flood Insurance Program (NFIP) as well as broader national floodplain management policies.\*\*

Appendix A presents the complete text of Section 1362.

#### A. PURPOSE OF THE STUDY

The overall objective of this research is to evaluate alternative means of implementing Section 1362 and determine those approaches most consistent with the public interest for the acquisition of flood damaged residential and non-residential properties in the context of other federal activities relating to non-structural floodplain management.

To achieve this broad objective five operational objectives were defined:

- (1) Estimate how many properties would have qualified for acquisition under Section 1362 in the past and project the future incidence of qualified properties;
- (2) Identify how Section 1362 acquisition can contribute to sound floodplain management, environmental improvement and how it can complement and support disaster mitigation and relief programs;
- (3) Estimate the magnitude and costs of Section 1362 acquisition;
- (4) Evaluate the effect of Section 1362 acquisition on individual owners and occupants of damaged structures as well as the communities in which they live; and
- (5) Identify and analyze the considerations involved in implementing Section 1362.

---

\* Section 1362 (c) is limited to the regulatory floodway, defined by current regulations as "the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height" (24 CFR 1909.1.)

\*\* The consistency of sub-section (c) with national floodplain management policies can be questioned from three perspectives: (1) generally, flood-proofing is a more viable alternative in flood fringe areas, particularly toward the outer edge of the hazard zone; in the floodway this alternative is least desirable; (2) the loan program, even though it applies only to existing development, could encourage new development in regulatory floodways, exposing the NFIP, local communities and individual citizens to greater risks; (3) floodway properties, especially in coastal areas, are frequently second homes. The desirability of offering low interest loans to increase the property value and decrease insurance premiums on second homes in high risk areas can certainly be questioned.

## B. METHODOLOGY

The research included the following seven tasks:

- (1) Review all federal legislation, regulations, Executive Orders and stated policies pertaining to floodplain management, with special emphasis on those that could be applied to the acquisition of flood-prone properties;
- (2) Identify economic, social, legal and environmental considerations inherent in flooded property acquisition under Section 1362;
- (3) Document and analyze the history of federal expenditures for pre- and post-disaster assistance relating to property acquisition;
- (4) Estimate the federal cost of acquiring flood damaged properties under Section 1362;
- (5) Determine the consistency of Section 1362 with sound land use management in the floodplain;
- (6) Conduct four community case studies of the scope and effects of 1362 acquisition if implemented; and
- (7) Develop policy and program alternatives for implementing Section 1362.

The research drew upon a variety of sources. The claims files of the National Flood Insurance Program from January 1970 to June 1979 provided the basis for estimating the program's magnitude and costs. Research into past and current efforts to acquire flooded properties helped resolve some of the issues associated with implementation.

Additional sources of information were a literature review; a review of federal and public responses to floods; a telephone survey of National Flood Insurance Program Coordinators in each state as well as selected floodplain management experts; brief reports on the experience of communities that had already undertaken acquisition projects and four community case studies, involving field interviews, in which hypothetical "1362" acquisition projects were evaluated. Also, current federal efforts in flood loss reduction and disaster assistance were studied to understand how Section 1362 could be coordinated with these activities.

The research for the study was completed between the summers of 1977 and 1979. Appendix B contains abstracts of the technical reports covering the four major areas of research.



## II. FLOOD LOSSES AND THE FEDERAL RESPONSE TO FLOODS

Floodplains serve the natural purpose of storing and carrying water from rivers and oceans during times of heavy runoff or storm surges. Conflicting with this natural purpose and reflecting the economic value of rivers for navigation and as sources of energy, as well as the recreational value of ocean and riverine beaches, floodplains have become important magnets for development. With the rapid growth of urban areas in the United States during the past decades, more and more floodplain land has been used for housing, commerce, industry, and other activities vulnerable to flood damage; frequently in the absence of knowledge about flood hazards and all too often despite such knowledge.

At best, information on national flood losses is gross and probably understates actual losses.\* However, available estimates of the average annual damage to property caused by floods illustrate the severity and upward trend of the nation's flood problem. Flood losses exceeded \$1 billion a year in 1966\*\* and more than doubled, in 1967 dollars, to \$2.24 billion in 1975.\*\*\* In 1979 dollars, average damage in 1975 amounted to \$4.7 billion and is expected to rise to \$5.8 billion at the end of the century if floodplain management improves, or to substantially higher levels if traditionally permissive controls on floodplain development prevail.\*\*\*\*

Actual flood losses vary widely from year to year and flood hazards are often underestimated. Damage levels in years of catastrophic disasters may be several times higher than estimated averages. One recent disaster, Tropical Storm Agnes, destroyed \$3.5 billion in property (\$5.8 billion in 1979 dollars).\*\*\*\*\* The damage caused by a powerful hurricane striking the newly and intensively developed south and middle Atlantic coastline could be much greater. An estimated six million people now live in areas vulnerable to hurricane surges.\*\*\*\*\*

---

\* House Document No. 465. A Unified National Program for Managing Flood Losses. August, 1966. p.3.

\*\* Ibid.

\*\*\* U.S. Water Resources Council. Estimated Flood Damages. January, 1977.

\*\*\*\* Ibid.

\*\*\*\*\* National Oceanic and Atmospheric Administration. Final Report of the Disaster Survey Team on the Events of Agnes. NDAA NDSR 73-1. February, 1973.

\*\*\*\*\* White, Gilbert F. and J. Eugene Haas. Assessment of Research on Natural Hazards. Cambridge, MA: MIT Press, 1975.

Over the past 50 years the federal government has assumed a larger role in the nation's response to floods by employing two approaches for mitigating the effects of floods upon states, communities and individuals: helping reduce future flood losses and providing relief from flooding when it does occur. The first approach, flood loss reduction, evolved as part of the emerging national water resources policy in conjunction with other water related federal activities such as water supply, hydroelectric power, navigation, recreation and commercial fishing. The other approach, flood disaster relief, emerged independently as part of an overall federal disaster relief and emergency management policy.

As federal flood loss reduction and disaster relief activities have been performed under these separate sets of policies and by different institutions, proper coordination has been difficult to achieve. Indeed, the evolution of federal flood policies over the last five decades can be described as a process of incremental adjustment to the need for more balance and coordination. Until recently, this process has occurred in two phases: an initial phase in which the effects of an unbalanced and disparate flood policy were first manifest and a subsequent phase of deliberate, gradual reorientation toward a more even and unified national response.

The following outline of the evolving federal policy during these two phases serves as the background for discussing public acquisition of floodplain lands as one method for reducing future flood losses within the framework of a balanced policy as well as the singular role of a property acquisition program under Section 1362.

#### A. EVOLUTION OF FEDERAL FLOOD POLICY

##### INITIAL PERIOD

The federal government began to finance flood protection projects in 1917.\* The Flood Control Act of 1936 - passed in response to flood disasters in the Kansas and Upper Susquehanna river basins as well as the Great Depression - expanded the federal responsibility for flood

---

\* The Flood Control Act of 1917 (33 U.S.C. 701-3) marks the beginning of federally sponsored flood control. Projects under this act were limited to the Mississippi and Sacramento Rivers.

protection projects to all navigable rivers in the nation. For several decades the only strategy for providing federally financed flood loss reduction under the Act was to modify flooding by constructing flood control works such as levees, channel improvements and reservoirs. By 1966, 30 years after the program began, the cost of such structural projects had exceeded \$7 billion.\*

Partly encouraged by the sometimes fallacious security offered by such projects, more development was attracted to riverine floodplains and, consequently, riverine flood losses continued to mount. Furthermore, coastal areas which did not initially benefit from structural flood control works suffered heavy losses of lives and property from a series of devastating hurricanes.

As flood losses rose federal flood disaster relief was granted more generously and more regularly. Congress passed the first comprehensive Federal Disaster Act in 1950 (PL 81-875) as well as complementary relief programs under the Small Business Administration (SBA) in 1953 and Farmers Home Administration (FmHA) in 1965. Disaster relief under these programs did not require mitigatory measures against future flood losses. Communities and owners were free to reconstruct damaged property, thereby recreating the conditions existing before the flood.

#### REORIENTATION TOWARD A "UNIFIED NATIONAL PROGRAM"

Thirty years of experience with federally financed structural flood protection, combined with rising flood losses and growing federal disaster relief costs, revealed two fundamental defects in the nation's response to floods. One was that exclusive reliance on a structural flood loss reduction strategy stimulated development in the floodplain and left coastal areas largely unprotected. The other was that the liberal use of flood disaster relief not only encouraged reconstruction in the floodplain but failed to provide any incentive for protecting against future flood losses by removing or flood-proofing high-risk land uses. As the two federal responses to flooding had evolved independently, the need for a more balanced and unified approach became apparent.

---

\* House Document 465, op. cit., p. 3.

The Water Resources Planning Act (PL 86-363, 1969), the first step toward a new approach to flood control policy, created the U.S. Water Resources Council, authorized the creation of federal-state river basin commissions and provided funds for state water resource planning.

In 1966 a Presidential task force, charged to review existing policies and to recommend a new approach, concluded that there was a need for "a national and unified program for managing flood losses" and that, beyond structural flood control works, "additional local and integrated policies are required to promote sound and economic development of the flood plains."\*

Specifically, the task force recommended that the nation:

- (1) Improve basic knowledge about flood hazards;
- (2) Coordinate and plan new development in the flood plain, taking proper account of the flood hazard;
- (3) Provide technical assistance to managers of floodplain property; and
- (4) Adjust federal flood control policy to sound criteria and changing needs.

Concurrent with submission of the task force's report to Congress, the President issued Executive Order 11296, Flood Hazard Evaluation, directing federal agencies to take the lead in preventing the uneconomic use and development of floodplains and in minimizing flood losses. The Water Resources Council was given responsibility for determining the need for further legislation and for preparing recommendations for implementing the postulated unified national program. The resulting report on A Unified National Program for Flood Plain Management was submitted to the President in July, 1976.\*\* An updated version was transmitted by the President to Congress in January, 1980.

In contrast to federal practices over the preceding 40 years, the Unified National Program calls for a non-structural strategy for flood loss reduction (to "modify the susceptibility to flood damage and disruption") in addition to the traditional structural strategy (to "modify flooding").

---

\* House Document No. 465, op. cit., p. 1.

\*\* The new term "floodplain management" highlights the change in emphasis from structural flood control projects to more comprehensive strategies including nonstructural approaches.

Furthermore, the Unified National Program integrates these two strategies -- a disaster relief ("modify the impact of flooding on individuals and the community"). Figure 1 shows the implementing tools associated with the three floodplain management strategies of the Unified National Program in relation to overlying national policies, the NFIP, and, specifically, Section 1362.

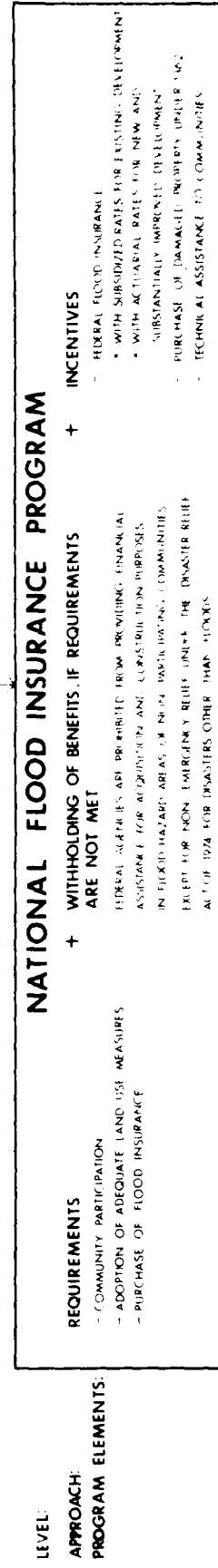
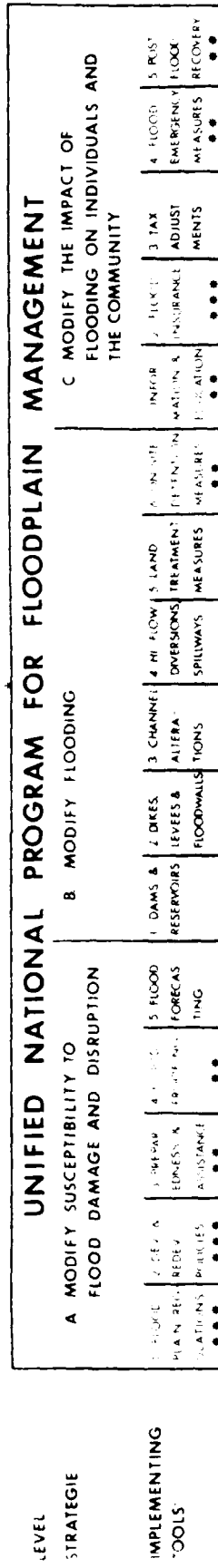
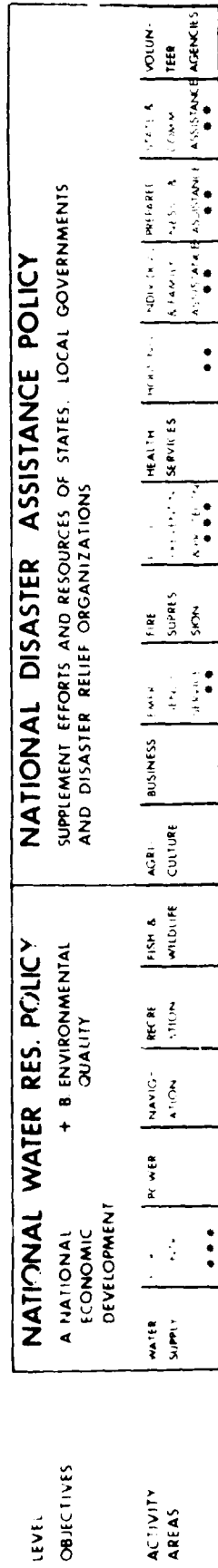
The gradual shift of federal policies towards coequal consideration of nonstructural flood loss reduction measures and better integration of flood loss reduction and flood disaster relief within the Unified National Program has been manifest in several major actions over the past twelve years. Among the most significant are the creation and evolution of the National Flood Insurance Program (NFIP), changes in the federal Disaster Relief Act, encouragement of nonstructural alternatives in the major federal water resource programs and recent executive initiatives.

#### THE NATIONAL FLOOD INSURANCE PROGRAM

Perhaps the most effective step to date toward a more balanced and unified approach for floodplain management has been the National Flood Insurance Program (NFIP). The need for a federal flood insurance program became apparent because the risk of catastrophic damage from flooding and the high cost of devising reliable actuarial rates had discouraged private industry from underwriting flood insurance. After initial attempts at establishing a federal program in the 1950's had failed, the Southeast Hurricane Disaster Relief Act of 1965 (PL 89-339) authorized a full-scale feasibility study of national flood insurance. This study was conducted under the auspices of HUD parallel to the work of the Presidential task force in 1966. Its recommendations served as the basis for the National Flood Insurance Act of 1968 (PL 90-448).<sup>\*</sup> The National Flood Insurance Program authorized under this Act offered federal flood disaster relief, in the form of largely subsidized flood insurance, contingent upon nonstructural flood loss reduction measures embodied in local floodplain management regulations.

<sup>\*</sup> U.S. Congress, Senate. 89th Congress, Second Session Committee on Banking and Currency. Insurance and Other Programs for Financial Assistance to Flood Victims. A Report from the Secretary of Housing and Urban Development to the President of the United States, 1966.

**FIGURE 1**  
**THE PLACE OF THE 1362 PROGRAM IN THE FRAMEWORK OF**  
**NATIONAL FLOOD LOSS REDUCTION AND DISASTER ASSISTANCE POLICIES**



... STRONG DIRECT CONNECTION WITH 1362  
 ... SUPPORTIVE OR INDIRECT RELATIONSHIP WITH 1362  
 NO - OR NO SIGNIFICANT RELATIONSHIP WITH 1362

Because flood data and maps outlining local flood conditions were lacking, only four communities and 20 property owners joined the program during the first year. A 1969 amendment (PL 91-152) established the "emergency" phase of the program, permitting communities to join before completion of the necessary studies and, consequently, before adoption of the required regulations.

Despite these liberal provisions participation in the NFIP grew very slowly during the ensuing three years. As only a few victims of Tropical Storm Agnes and the Rapid City flood in 1972 were protected by flood insurance the federal government incurred record outlays under conventional disaster loan and grant programs. To effectively promote enrollment in the NFIP the Flood Disaster Protection Act of 1973 (PL 93-234) amended the NFIP in two important ways. First, it substantially increased the limits of insurance coverage; and second, it introduced provisions for withholding certain federal benefits from flood prone communities that chose not to participate in the NFIP as well as owners of flood prone structures unwilling to purchase flood insurance.

Public Law 93-234 was indeed effective. From January 1974 through 1977 more than 13,000 communities joined the NFIP, at an average annual rate more than four times as high as the first four years, while the number of policies in force increased from about 300,000 to 1.2 million. As shown in Table 1 and illustrated in Figure 2, flood insurance subsidies\* expanded between Fiscal Years 1972 and 1976 from .5% to 45% of all federal disaster relief subsidies to the private sector.

The Housing and Community Development Act of 1977 (PL 95-128) contained three major amendments to the NFIP. First, the provisions withholding benefits from non-participating communities were substantially relaxed; second, the coverage limits for communities in the Regular Program were raised; and third, the authority to purchase flood-damaged property under Section 1362 was expanded.

---

\* In this analysis the face value of all disaster relief grants and the discounted present value of the interest subsidies connected with all disaster relief loans were compared to the subsidized portion of the total amount of all flood insurance payments.

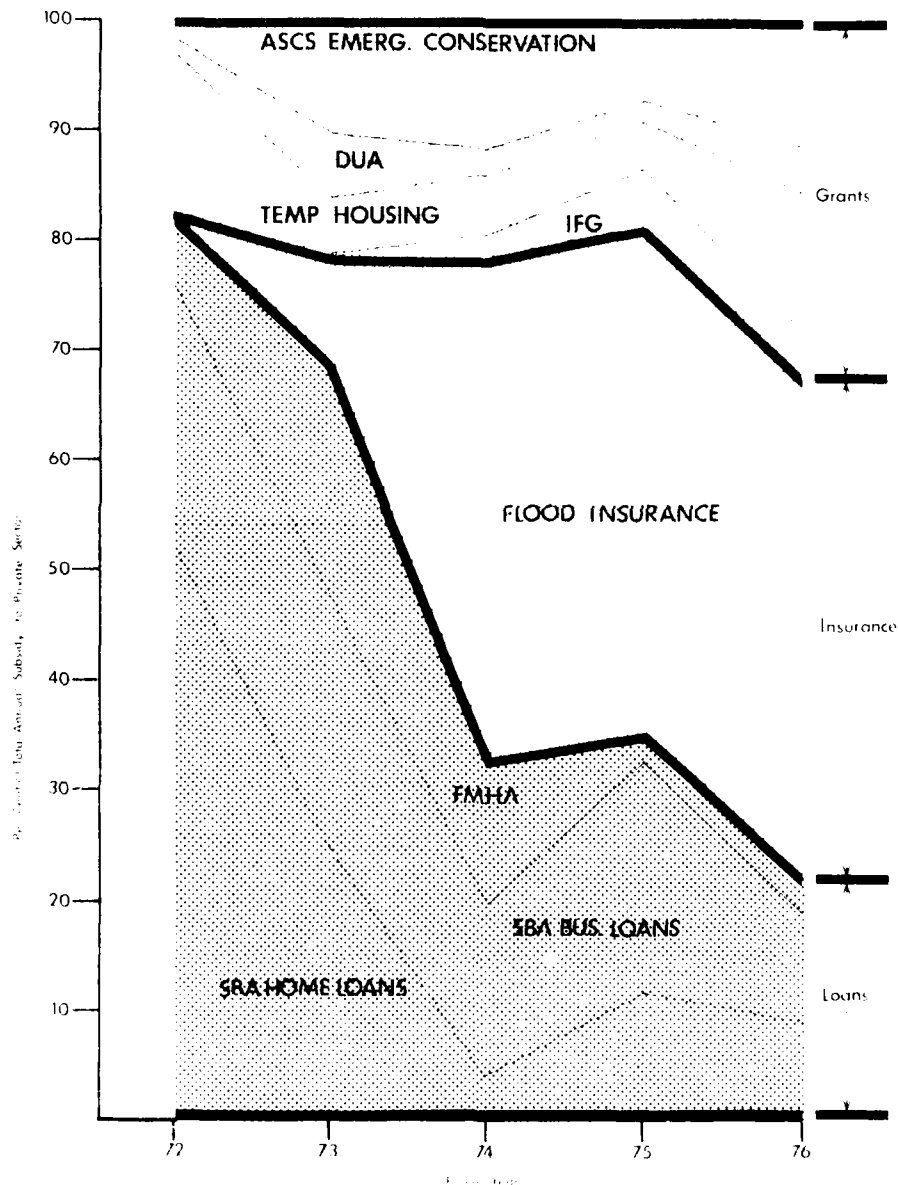
1000

THE UNIVERSITY OF CHICAGO

Source: Task report on "History of Federal Expenditure on Pre- and Post-Disaster Assistance".



**FIGURE 2**  
**PERCENTAGE OF ALL FEDERAL FLOOD**  
**DISASTER SUBSIDIES TO THE PRIVATE**  
**SECTOR BY VARIOUS PROGRAMS**



SOURCE: TABLE 1

Despite relaxing the provisions for withholding benefits from non-participating communities the NFIP has continued to grow. By the end of February 1980 it encompassed 16,785 communities and 1,794,008 policies with a total coverage of \$74.764 billion.

Transfer of the NFIP from the Department of Housing and Urban Development to the newly created Federal Emergency Management Agency (FEMA) on April 1, 1979, more closely integrated flood insurance into the overall framework of federal disaster relief and non-structural flood loss reduction efforts.

#### Changes in the Federal Disaster Relief Act

An additional major step towards a more unified and balanced approach to floodplain management has been the gradual reorientation of the federal disaster relief program to pre-disaster planning and hazard mitigation. The Disaster Relief Act of 1969 (PL 91-79), passed in response to heavy damage along the Gulf coast in the aftermath of Hurricane Camille, and its immediate successor, the Disaster Relief Act of 1970 (PL 91-606), authorized federal assistance to states in developing disaster plans. The Disaster Relief Act of 1974 (PL 93-288), reflecting the experience gained in the aftermath of Tropical Storm Agnes, encouraged - in addition to expanding federal, state and local disaster preparedness planning - "insurance coverage to supplement or replace governmental assistance" and "hazard mitigation measures to reduce losses from disasters including development of land use and construction regulations".\*

Specifically, Section 406 of the 1974 Act made disaster loans and grants conditional upon an agreement by state or local governments to evaluate natural hazards in the areas where the proceeds of such loans and grants are to be used and to take appropriate steps to mitigate such hazards in accordance with federal standards. This provision highlights not only the growing emphasis of the federal disaster relief program on hazard mitigation, but also the slow pace of change: regulations for implementing Section 406 became effective on December 10, 1979\*\* more than five years after the Act was signed.

---

\* Sec. 101.

\*\* F.R. 44:64809. November 8, 1979.

### Encouragement of Nonstructural Alternatives in the Major Federal Water Resources Program

In response to criticism of the almost exclusive reliance of the major federal water resources programs on structural projects as well as of federal cost-sharing formulas, Congress enacted Section 73 of the Water Resources Development Act of 1974 (PL 93-251). Section 73 (a) requires federal agencies to fully consider nonstructural alternatives, including floodplain regulation, acquisition and relocation, "with a view toward formulating the most economically, socially and environmentally acceptable means of reducing or preventing flood damages." According to Section 73 (b) cost-sharing provisions for nonstructural alternatives should be comparable to cost-sharing for structural alternatives with a maximum local share of 20%.

Although nonstructural alternatives have been investigated as part of a relatively large number of water resources projects during the past five years, no Section 73 project has yet been completed. A recent report by the U.S. Army Corps of Engineers, St. Paul District, found that:

As of January 1979, no projects using primarily nonstructural measures to reduce current levels of flood damages have been implemented by the Corps of Engineers. It is possible that one project will begin implementation this year in Wisconsin with a second possible in Texas beginning in 1980. Three others, two in Michigan and one in Georgia, have more remote chances of eventual implementation. No other such projects are on the horizon, nor do they seem likely.\*

One of the reasons for the slow advance of nonstructural floodplain management under Section 73 has been a bias in the standards and procedures that are used to evaluate water resources projects against nonstructural alternatives.\*\*

---

\* U.S. Army Corps of Engineers, St. Paul District, The Development of Nonstructural Alternatives. May, 1979.

\*\* For example, the reduction of flood losses suffered by occupants of floodplains, a major economic benefit of structural projects, may not be considered an economic benefit for nonstructural alternatives involving acquisition. The market value of flood-prone property is presumed to reflect the risk of flood loss. (See Chapter III, National Benefits of a 1362 Program.)

As elaborated later in this report Section 1362 is not subject to these procedures. While Section 73 projects are long term investments that lend themselves to extensive analyses and evaluations of alternatives, acquisition under Section 1362 is designed to be put into place immediately after a flood in support of mitigation measures. If a time consuming project-by-project evaluation were needed for Section 1362 the program would be infeasible.

#### Recent Executive Initiatives to Promote Nonstructural Flood Protection

Executive Order 11988, Floodplain Management, was signed by the President on May 24, 1977. It replaced Executive Order 11296 (1966), expanding its purposes to include preservation and enhancement of natural values and gave greater responsibilities to federal agencies. The Order further required that national actions affecting federal real property in floodplains be consistent with the objectives of the Unified National Program for Floodplain Management. Specifically, the purpose of Executive Order 11988 is:

to avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modifications of flood plains and to avoid direct or indirect support of flood plain development wherever there is a practicable alternative.

The President's Water Policy Message of June 6, 1978 and Executive Order 12113, Independent Water Project Review (January 4, 1979), further strengthened the Unified National Program by requiring that whenever structural water resources projects or programs are considered a primarily nonstructural plan be evaluated as one alternative.

Despite a national concern with nonstructural floodplain management for over a decade, a recent report confirmed that there is still "a strong bias against non-structural solutions in general, and, in many cases, a strong bias in favor of certain structural solutions."\* Thus, since

---

\* U.S. Water Resources Council, National Water Resources Policy Study, Task Force on Revision of Water Planning and Evaluation Criteria and Procedures, Final Task Force Report, December 5, 1977, p. 17.

1966, when the need for a more balanced and coordinated federal flood policy was first officially formulated, non-structural flood loss reduction has remained in its infancy while federal expenditures for structural flood control projects have doubled from \$7 to \$14 billion. A national consensus must still be formed if nonstructural flood loss reduction is to become a viable alternative to traditional structural projects.

#### B. FLOODPLAIN ACQUISITION

Public acquisition of severely flood-prone land is perhaps one of the most promising methods for nonstructural flood loss reduction. According to a recent report to the President's Committee on Water Policy, acquisition of floodplain lands can generally serve four objectives:

- Permanent protection of flood conveyance, flood storage and groundwater recharge areas;
- Public access to river, lake and ocean fronts and other recreational benefits;
- Savings in community infra-structure costs; and
- Complement broader floodplain management plans.\*

If the land is undeveloped acquisition may also help protect wetlands and prime agricultural soils. If the land is developed additional benefits of floodplain acquisition include waterfront redevelopment opportunities, the creation of parks and other recreation areas, and, most important, an end to the recurring cycle of flood damage.\*\* By enabling occupants of flood risk areas to move to safer locations, acquisition can help to remove the threat to life and limb, prevent future property losses and promote the right to a decent home and suitable living environment adopted by Congress in the National Housing Act of 1949.

As with other nonstructural flood loss reduction techniques, floodplain acquisition has played only a small role in federal hazard mitigation. Only two federal programs specifically authorize acquisition of flood-prone land as a

---

\* Kusler, Jon A., Floodplain Acquisition: Issues and Options in Strengthening Federal Policies, Prepared for the President's Committee on Water Policy, October, 1979.

\*\* Ibid.

general purpose: Section 73 of the Water Resources Act of 1974 which encourages consideration of nonstructural approaches in the protracted planning process for federally funded water resource projects, and Section 1362 of the National Flood Insurance Act of 1968 - the subject of this study - which permits acquisition of certain property when it is damaged. As noted, the effect of Section 73 on federal water resources projects has been negligible and Section 1362 still awaits full implementation.

The Water Resources Development Act of 1974 also authorized acquisition of flood-prone property for three specific projects. The first, which involved federal purchase of wetlands in the floodplain of the Charles River near Boston, Massachusetts, has been completed. The second authorized acquisition of improved property in Prairie du Chien, Wisconsin. Although funds for initial planning were authorized in 1965 and the community first expressed official support in 1970, this project is still incomplete. The third project, involving federal acquisition of an area subject to subsidence and coastal flooding in Baytown, Texas, has not yet been implemented.

While federal programs emphasizing floodplain acquisition have been used very sparingly, many communities have used a variety of other federal, state, local or even private funds to buy floodplain property, mostly for re-use as open space. To obtain an indication - rather than a complete inventory - of the extent and characteristics of this activity, a state-by-state inquiry was conducted in 1977 as part of this study. It revealed that improved floodplain property has already been acquired or was being acquired in at least 48 instances. In 36 of these cases the source of the funds could be determined. In half of them the funds came from the U.S. Department of Housing and Urban Development's (HUD) Urban Renewal Program or its successor, the Community Development Block and Discretionary Grant Program. Twelve of these cases involved solely HUD funds and in six HUD funds were combined with money from either the U.S. Army Corps of Engineers (COE), the Land and Water Conservation Fund (LAWCON) of the Heritage Conservation and Recreation Service (HCRS), the Tennessee Valley Authority (TVA) or State and local sources.

Of the 18 cases that did not involve HUD funds, half were municipally financed and one also involved federal funds,

from the Economic Development Administration (EDA). Five other projects were funded by the TVA, two by states and regional agencies and two by private sources. Six of the 36 cases involved acquisition of both developed and undeveloped properties. The cost of most projects was rather modest, but some ranged from about \$10 to \$20 million. By far the most extensive effort to acquire developed floodplain lands was a \$65 million urban renewal project in Rapid City, South Dakota, involving the relocation of about one thousand families from an area devastated by the 1972 flood.

Most public floodplain acquisition has involved undeveloped land. LAWCON funds alone were used to purchase floodplain land in 371 cases between the spring of 1974 and August, 1977.\* The single completed floodplain acquisition project under the Water Resources and Development Act of 1974, in the Charles River Basin, was also limited to undeveloped property.

Eight cases in which developed floodplain land was acquired were examined more closely. They revealed a broad range of community sizes and types, socio-economic settings, techniques, financing arrangements and specific acquisition purposes. For instance, some programs focused solely on flood damage reduction, others on the reuse of acquired land and still others on a combination of objectives.

Several conclusions can be drawn from existing efforts to acquire developed floodplain property for public purposes:

- Although many communities have an active interest in floodplain acquisition, they believe that federal policies still encourage structural flood loss reduction measures. The lack of adequate grants-in-aid, unfavorable cost-sharing requirements, a cumbersome and extremely time-consuming planning process and the lack of certainty in funding have discriminated against nonstructural flood loss reduction through floodplain acquisition.
- Typically, most communities have embarked on floodplain acquisition for a broad range of reasons, including, but not limited to, loss reduction.

---

\* Heritage Conservation and Recreation Service (HCERS), Printout of LAWCON activities: The data does not specify whether properties were developed or undeveloped. Since the state-by-state inquiry did not reveal any case of LAWCON acquisition of developed property, the program appears to have been used essentially for undeveloped land.

- Floodplain acquisition has almost always been in fee; leases or easements have been considered too complicated or of limited benefit.
- Local or state purchase has been preferred to direct federal acquisition.
- Typically, acquisition has been used in combination with other nonstructural flood loss reduction measures, such as land use regulations. Some communities have attempted to acquire entire floodplain areas.
- Typically, acquired land has been used as open space, few communities have permitted partial redevelopment.
- Citizen participation and the use of local task forces has been a key to successful acquisition programs.
- No program now in use permits acquisition of flood prone property immediately after it has been damaged.

The last conclusion is of particular importance to this study. Section 1362 of the National Flood Insurance Act of 1968 authorizes the acquisition of certain properties in flood risk areas after they are damaged. If used in the immediate aftermath of floods, together with the flood insurance claims settlement process, this program could encourage owners of damaged property to relocate, thereby helping break the cycle of recurring flood losses.

#### C. THE ROLE OF SECTION 1362 WITHIN THE NATIONAL FLOOD INSURANCE PROGRAM

In a broader sense, then, Section 1362 is a valuable tool for acquiring damaged floodplain property to reduce reoccurring flood losses. However, its general purpose must be defined more specifically in the context of the National Flood Insurance Program.

The NFIP combines two strategies of the Unified National Program for Floodplain Management: non-structural flood loss reduction and disaster relief in the form of flood insurance subsidies.\* The two strategies are linked by interdependent program elements (see Figure 5).

---

\* As noted, the official terminology for the first strategy is "modifying susceptibility to flood damage and disruption" and for the second "reducing the impact of flooding on individuals and the community."



Three of these elements are requirements of the NFIP. First, communities with special flood hazard areas\* must participate if they wish to benefit from the NFIP as well as certain other federal programs. Second, after issuance of a Flood Insurance Rate Map (FIRM), communities must adopt and enforce floodplain management regulations meeting federal minimum standards. The purpose of these regulations is to prevent new hazardous development in the floodplain and to correct existing, non-conforming development before it is substantially improved.\*\* Third, the program encourages owners of property in special flood hazard areas to purchase flood insurance.

To make these requirements acceptable or, at least locally enforceable, the program includes three important incentives. First and foremost, the program makes flood insurance available for structures and contents up to certain coverage limits. In Emergency Program communities premium rates for all structures are subsidized. In Regular Program Communities rates for existing structures are subsidized up to certain levels\*\*\* and rates for new and substantially improved structures are charged at actuarial levels. Within coverage limits one-family structures can be protected up to the cost of full replacement and other structures and contents up to their depreciated replacement value. The second incentive of the NFIP is the acquisition of certain damaged properties under Section 1362. Since the replacement value of most structures can be covered by insurance, the chief significance of the Section 1362 incentive is the possibility of paying for the land when the public interest will be served by removing certain severely flood-prone uses from the floodplain. The third incentive is FIA's new technical assistance program which has been created to help communities assess their flood problems and identify solutions by:

providing advice, technical guidance and information publications and other tools to regional staff in support of overall program and individual project activities (pre- and post-flood disaster); by identifying the need

- 
- \* Defined as areas with at least a 1% annual probability of floods.
  - \*\* Substantial improvements are currently defined as any rehabilitation, addition or repair with a cost of at least 50% of pre-flood market value of the structure.
  - \*\*\* Beyond these levels "second layer" coverage may be obtained at actuarial rates. It should be emphasized that actuarial rates are not always higher than subsidized rates.

for, initiating and supervising special studies on construction standards related to flood plain management and non-structural strategies and techniques of hazard mitigation; and by developing and providing supervision and guidance in the implementation of new inter-agency hazard mitigation programs (such as interagency disaster survey teams and hazard mitigation funding programs), or for new and innovative intra-agency programs, such as the acquisition and relocation of flood damaged structures under Section 1362 of the National Flood Insurance Act and the Standard Flood Insurance Policy.\*

From the inception of the NFIP it was recognized that its success depended greatly on the proper balance between these requirements and incentives, or on an effective use of the program's "carrot and stick" approach.\*\* If requirements were not properly balanced by incentives they would remain unenforceable. Conversely, if incentives were not effectively linked to requirements public funds would not only be wasted but could produce highly undesirable results.\*\*\*

During its first decade, the NFIP faced the urgent task of establishing flood insurance as the principal form of federal flood disaster relief. Three program features - community enrollment, purchase of flood insurance and, as a result, flood insurance claims payments - soared. On the other hand, because of the time required to complete Flood Insurance Rate Maps and determine actuarial rates, the full insurance benefits of the program as well as the

---

\* FIA, Draft Statement on Technical Assistance, January, 1980.

\*\* For example, HUD's 1966 report on Insurance and Other Programs for Financial Assistance to Flood Victims stated: "Two objectives of flood insurance are equally important: to help provide financial assistance for victims of flood disasters in order to rehabilitate their property; and to help prevent unwise use of land where flood damages would mount steadily and rapidly. Flood insurance is a mechanism which can keep both objectives in balance without either outweighing the other." p. 2.

\*\*\* The President's task force on federal flood control policy, working parallel to HUD's study group on flood insurance, expressed its concern about this possibility as follows: "A flood insurance program is a tool that should be used expertly or not at all. Correctly applied, it could promote wise use of floodplains. Incorrectly applied, it could exacerbate the whole problem of flood losses." House Document No. 465, A Unified National Program for Managing Flood Losses. 1966, p. 17

required floodplain management regulations were implemented at a much slower pace. Moreover, the incentive of property acquisition under Section 1362 remained unused. As long as some requirements were not balanced by the necessary incentives they remained ineffectual.

In particular, the corrective requirement that rebuilt substantially damaged, nonconforming structures and other substantial improvements conform to the NFIP regulations was virtually ignored. A recent study of the subject for FIA found:

Few documented cases where the regulations have been implemented are on record for the Nation. . . . Also, discussions with planners and zoning and building officials indicate that implementation of the current substantial improvement language in the Nation's Flood Insurance Program was virtually nonexistent.\*

The NFIP's minimum requirement for such structures is reconstruction at or above base flood levels.\*\* Since until recently flood insurance payments covered at most the cost of repair to original conditions and acquisition under Section 1362 was not implemented, owners almost always repaired at variance with NFIP regulations, even if they wished to relocate or to reconstruct on-site at a safe elevation. Without suitable incentives for compliance the regulatory requirement was as ineffectual as most traditional attempts to eliminate non-conforming land uses through regulation.

Since 1978, the NFIP has begun to interpret the Standard Flood Insurance Policy more flexibly, permitting, in certain cases and at the discretion of the Administrator, flood insurance payments at levels above the cost of repair to original conditions. Thus, the Secretary of the Department of Housing and Urban Development, then the head

---

\* Sheaffer & Roland, Inc., Alternatives for Implementing Substantial Improvement Definitions. Federal Emergency Management Agency, Federal Insurance Administration, April, 1980.

\*\* Defined as the elevation of a flood with a one percent annual probability.

of the NFIP, determined in February 1978 that "where repair of the structure damaged by an insured event is not allowed by statute or regulation, the insured has a construction total loss. Such interpretation is clearly in keeping with the purposes of the program."\* Recent NFIP interpretations permit the relocation of dwellings situated in dangerous flood hazard areas in cases where repair is prohibited by local authority. The Administrator has determined that this provision can be construed to permit, by agreement between an insured owner and the Administrator, a claims settlement up to full value of the policy. In many cases this may be sufficient to pay the cost of removing the insured property from a dangerous flood hazard area, such as a velocity zone or a floodway, or elevating structures above the 100-year flood level.

These important incentives for attaining compliance with the NFIP's corrective floodplain management regulations have been implicitly authorized from inception of the program but are only now beginning to be used. As these techniques are limited to payments for structures Section 1362 enforces as a key complement to the NFIP enabling the site to be purchased. It is in the public interest to remove an insured structure. Its implementation offers communities and owners a choice of either relocating from certain hazardous sites or complying with the minimum requirement for on-site reconstruction at the base flood elevation. Owners in Regular Program Communities rejecting either choice would have to pay unsubsidized actuarial flood insurance rates for substantially damaged structures.

The proper role of Section 1362 within the NFIP thus is to serve as a key incentive for accomplishing the legislative intent of gradually eliminating flood losses and federal subsidies to existing structures through corrective measures.

---

\* Policy Determination by Secretary Patricia Roberts Harris to Senator Clifford Case, February 16, 1978.

This intent was succinctly stated when the bill which became the National Flood Insurance Act of 1968 was first submitted to Congress: "as these existing properties become less numerous, over time, the need for insurance at less-than-actuarial premium rates will decrease and the program should evolve toward a self-sustaining basis."\*

When used in this manner, benefits from Section 1362 extend beyond participating communities and owners to the entire flood insurance program.

---

\* Letter by Assistant Secretary Robert C. Wood to Vice President Hubert H. Humphrey of June 27, 1967.

### III. PAST AND PROJECTED INCIDENCE OF PROPERTIES ELIGIBLE FOR ACQUISITION UNDER SECTION 1362

As a first step in analyzing flooded property purchase under Section 1362, this Chapter presents a profile of the past incidence of residential and non-residential properties with flood insurance claims which would have met the eligibility criteria for acquisition, as well as projections of the future incidence of such properties. Based on previous analyses performed for FIA, the number of properties substantially damaged by causes other than floods and, therefore, potentially eligible for acquisition under Section 1362 (b) is also projected.

To qualify for purchase under Section 1362 (a) properties must be insured and "damaged substantially beyond repair" by a flood, or damaged by three or more floods in five years, with structure damage averaging at least 25% of the value of the structure at the time of each flood event. The term "damaged substantially beyond repair" is not defined by law; however, it can be seen as analogous to a damage requiring a "substantial improvement". As defined in the NFIP's regulations, "substantial improvement" means any repair, reconstruction or improvement to a structure, the cost of which equals or exceeds 50% of the market value of the structure either (a) before the improvement or repair is started, or (b) if the structure has been damaged and is being restored, before the damage occurred...\*

The regulatory reference to market value poses some difficulty. Since NFIP data is limited to information for insurance purposes, only the depreciated replacement value - cash value - of insured structures is known. In theory, the depreciated replacement value of a structure should equal its market value, with the market value of land accounting for all locational factors. In practice, however, the two types of estimates may be very different. For example, the structure market values of critical properties in three of the four communities that were studied as part of this research project were less than cash values. Overall, the market value of structures that may have qualified for Section 1362 in the case study communities

---

\* CFR 24, 1909.1 (October 26, 1976). Now codified at 44 CFR part 59, 159.1

averaged 85% of cash value. This information, however, did not permit generalizations since these communities had experienced abnormally frequent flooding in recent years. Therefore, the theoretical identity between cash and market value was assumed to pertain and NFIP cash value data was used as an estimate of structure market value. Thus, for the purpose of this report, "damage substantially beyond repair" is defined as damage whose cost of repair equals or exceeds 50% of structure cash value.\* All flood damage which meets or exceeds the 1362 damage level threshold is referred to as "critical damage", properties so damaged are defined as "critical properties" and policies for such properties "critical policies".

The primary source for the profile of critical properties was original data, heretofore unanalyzed, on insurance claims paid by the National Flood Insurance Program (NFIP) from January, 1970 to June, 1979. This period is referred to as the "analysis period". Conclusions derived from this data are tentative, rather than statistically reliable, because the analysis period was a time of program growth from modest beginnings to near maturity. Future, more mature periods may differ from this phase of rapid expansion. A review of the historical data revealed, however, fairly consistent patterns since 1974. Second, the operation by the National Flood Insurers Association (NFIA), a consortium of private insurers, to its present direct operation by the Federal Insurance Administration (FIA) assisted by private fiscal agents. While the claim records for the period following the change are in excellent condition, the older records are unreliable and more difficult to use. In particular, the older records repeated identical claims. After controlling for this circumstance it was possible to use the older as well as the newer records for the analysis.\*\*

Based on the work with these files it appeared that the claims data as currently collected could become a most useful source for refining insurance rates, enforcing substantial improvement regulations and, possibly, developing better methods of flood resistant construction.

---

\* Consistent with this definition, "value of the structure" as applied to repetitively damaged properties is also defined as cash value.

\*\* Other data tapes from the initial period were more seriously deficient. For example, the Inception-to-Date policy file for the 1970 to 1977 period has several data gaps and was of limited use for the study.

#### A. HISTORICAL PROFILE

From January, 1970 through June, 1979, 6,146 insured properties - seven percent of all properties with claims for structure damage - suffered critical flood damage.\* More than three-fourths of these properties were single-family homes, 7% mobile homes, 11% two-to-four family homes, less than 1% other residential structures and 5% non-residential uses. Compared to the distribution of all policies in force, the share of single-family homes among critical properties was somewhat smaller, while the relative share of mobile homes was larger.

Twenty-one percent of the historical critical properties were in the Northeast, 15% in the North Central states, 58% in the South and 6% in the West. The incidence in Puerto Rico and U.S. Territories was negligible. A comparison with the regional distribution of all policies in force revealed that the South had a disproportionately large share of critically damaged properties: its share of critical properties was almost twice as large as its share of properties enrolled in the NFIP.

Starting in 1974, an average of 1.5% of all critical properties qualified as a result of repetitive damage, ranging from a low of .9% in 1978 to a high of 3.2% in 1976. Since this damage criterion covers a five year period and the analysis period covered only 9½ years, with very low enrollment during the first years, future longer term averages may differ. However, the data did not reveal a tendency toward a larger average share of repetitively damaged critical properties during the latter part of the analysis period. Thus, the statutory requirement of three damage events, rather than the brevity of the analysis period, appears to be responsible for the low historical incidence of repetitive critical claim. If, for instance, the present statutory requirement was reduced to two incidents in three, four or five years, repetitive claim critical properties would account for between 12% and 14% of all critical properties. Since the benefits of Section 1362 acquisition are most apparent in connection with repetitively damaged properties, a reduction of the present statutory requirement to two incidents seems desirable.

---

\* Three percent (140) of these properties suffered critical damage more than once.



Four-fifths of all critical properties were damaged by riverine floods. Only in two periods - before 1973 (Florida) and 1978 (New England) - did coastal floods account for a major share of all critically damaged structures in any region.

The average ratio of structure damage to cash value was 72% and of contents damage to cash value 60%. Average damage ratios for mobile homes exceeded the overall averages by 10%.

By the end of June, 1979, 1,139 communities had at least one critical property. About one-third (36%) of these communities were in the Northeast - a share almost equal to its share of communities in the NFIP. Relatively small percentages of these communities were in the North Central and Western regions (21% and 7% respectively) while a relatively large group was in the South; the South accounted for 37% of the communities with critical properties, compared to only 26% of the communities in the program.

Critical properties were unevenly distributed among communities. Over the entire analysis period more than two-thirds (67%) of the affected communities had only one or two critical properties and 91% had less than ten. Only 104 communities, or about 9% of all communities with critical properties, had ten or more such properties by the end of June, 1979. About 60% of these communities were in the South.\*

The number of communities with ten or more critical properties in a single year was even smaller but this group contained close to 60% (3,488) of all critical properties.\*\* The regional distribution of this sub-group is even more heavily concentrated in the South (70%) than the incidence of all critical properties.

Less than half (46%) of all past critical properties were associated with a Presidential disaster declaration. The regional distribution of critical properties meeting this

---

\* NFIP communities range widely in size, from boroughs covering less than one square mile to large counties and parishes of about 1,000 square miles. Generally, however, the size of communities is smallest in the northern regions.

\*\* The threshold of ten properties was chosen arbitrarily.

condition was more constant than the distribution of all critical properties; 46% were in the South, about one-third of all critical properties in that region. In the North-west and North Central region close to 60% of all critical claims were connected to a Presidential disaster declaration and in the West the share of properties meeting this criterion was as high as 70%.

To explore the sensitivity of the total number of properties that may have been eligible for acquisition under Section 1362 to alternative eligibility definitions, the claims data from January, 1970 through March, 1977 were screened for policies with damage from a single event exceeding 40%, 45% and 55% of cash value. Compared to critical properties as defined for this study: (1) 35% more properties suffered damage exceeding 40% of cash value; (2) 21% more properties suffered damage exceeding 45% of cash value; and (3) 23% fewer properties suffered damage exceeding 55% of cash value. The analysis of the complete claims file through June, 1979 showed that about 30% more properties were damaged at or above 42.5% of cash value than at 50% of cash value. This last alternative threshold was used to test how many more properties might have qualified for 1362 acquisition if the average relationship between market value and cash value found in the case study communities (85%) were representative and if market value were used to determine eligibility under Section 1362. As noted, however, there is no reason to believe that the extremely low market values of critical properties in some of the case study communities are typical.

During the analysis period flood insurance claims payments to critical policies totaled \$98 million (in 1979 dollars), accounting for one-fifth of all claims payments made by the National Flood Insurance Fund. In the West more than one-fourth of all payments went to such policies. Nationwide, 60% of all claims payments for mobile homes were made to critical policies. A review of the record of claims payments for structure damage reveals even more strikingly the extent to which the FIA's insurance expenditures have been allocated to critical policies; nationally \$80.2 million, or close to one-fourth of all payments for structure damage have gone to this class. The average critical policy received payments totalling \$15,900 (in 1979 dollars), almost two and one-half times the average payment of \$6,700 received by all policies (including critical policies). Structure damage accounted for \$13,000 or four-fifths of the average payment to critical policies, compared to \$4,400 or two-thirds of the average payment to all policies with claims for structure damage.

The cost of the 1362 program will depend largely on the average pre-flood market value of critical properties. To estimate the average pre-flood market value of historical critical properties three main assumptions were made. First, as already stated, it was assumed that market value equals the recorded cash value of damaged structures.\* A second assumption was needed to estimate the land value of critical properties. The NFIP claims data does not include information on land value. Since about 95% of all critical properties were small residential structures (84 single-family and 11 two-to-four family properties) the recent average relationship between land value and total property value of 25% was adopted for all critical properties, both residential and non-residential.\*\* The third assumption applies to mobile homes. NFIP claims data does not reveal whether mobile homes are used as real property on land owned by the owner of the structure or as personal property on rented or donated sites. Since Section 1362 is limited to real property, it was assumed that mobile homes would only qualify for acquisition if they are purchased together with the land on which they are located. Consequently, the estimated average market value of mobile homes also includes a land value component based on the same assumptions used for all other properties.

Employing these assumptions, the weighted average value of critical properties, adjusted to 1979 levels, amounted to \$27,700, ranging from about \$45,000 for non-residential properties and properties with five or more dwelling units to about \$29,000 for single-family homes and \$10,000 for mobile homes. These values are comparatively low; for instance, the average value of critical single-family homes amounted to only about 75% or less of median regional single-family housing values.\*\*\*

The cost of the Section 1362 program will also depend largely on the extent to which the market value of critical structures is covered by flood insurance. The average insurance coverage in relation to the cash value of historical

---

\* It should be noted that this assumption would yield conservative (i.e., high) market values for acquisition cost estimates if market value is generally lower than cash value, as was found in the case study communities.

\*\* The 1978 national median as reported by the National Association of Home Builders ("Land Plays Rising Role, Labor a Reduced One, in the Long, Steep Climb in the Cost of Housing", The Wall Street Journal, October 11, 1978, p. 48.

\*\*\* Estimated for 1979 on the basis of available Annual Housing Survey data for previous years.

critical properties were insured at or above 100% of cash value. In fact, a relatively large share of all critical properties was insured above the maximum value for which insurance payments can be collected.\* To control for such over-insurance the effective insurance coverage of critical policies was analyzed. Effective coverage is defined as the coverage on which insurance can be collected. It is limited by structure value, which is defined as the cash value for all structures, except single-family homes (including mobile homes), insured at or above 80% of full replacement value. For the latter group structure value is defined as full replacement value. The community case studies yielded data on the relationship between full replacement value and the cash value of critical single-family homes. By applying this data to all critical properties average effective coverage was estimated at 93% of cash value. In other words, in case of a total loss, all but 7% of the cash value of the average structure would have been covered by flood insurance. As more communities enter the Regular Program higher coverage will be more widely available and overall effective coverage may further increase. Still another indicator of insurance coverage is the percent of properties insured at or above encouraged levels. Within maximum insurance limits the NFIP encourages insuring all structures, except single-family homes, at cash value. Insurance for single-family homes is encouraged at a minimum of 80% of full replacement value. By applying the average relationship between full replacement value and cash value found in the case studies to the national claims data it was estimated that one-third of all critical properties were insured at or above encouraged levels.

Actual insurance payments to critical structures have not been nearly as high as average effective coverage for three reasons. First, the NFIP adjusts claims on the basis of damage. Single event damage has generally been much lower than effective coverage, averaging about 70% of cash value, while repetitive event critical damage averaged only about 30%. Second, although wind damage often accompanies flood damage it is not covered under the flood insurance policy. Third, a \$200 deductible reduces the payment to owners for damage to insured structures. As a result, actual insurance payments for critical structure damage averaged only 58% of cash value, with little variation by region.

---

\* Nationwide, about 20% of all one-family homes, 53% of all two-to-four family homes, 61% of other residential structures and 42% of non-residential structures were insured at or above maximum insurable value.

The residual value of critical structures was defined as the portion of market value not covered by insurance payments. If a critical property were to be publicly acquired, this portion would have to be paid in addition to land value, and if applicable, relocation payments. Historically, residual structure market value has been relatively high, averaging \$42 of estimated market value.

#### B. PROJECTED FUTURE INCIDENCE OF CRITICAL PROPERTIES

##### AVERAGE ANNUAL INCIDENCE OF CRITICAL PROPERTIES

As a first step in projecting the future incidence of properties that might qualify for 1362 acquisition, the historical annual incidence of critical properties was analyzed in relation to two other variables. First, the incidence of critical policies as a sub-group of all policies with claims for structure damage was investigated. Nationally, it averaged 7% during the analysis period, ranging from 4% in the Northeast to 10% and 11% in the South and West, respectively. The annual incidence was as high as 13% in 1973, possibly reflecting the larger share of high risk properties in the program at that time, and ranged from 3% to 9% from 1974 on, with a narrower range of 5% to 7% in four of the six years. While these ratios were relatively even, they are of limited value in projecting the total number of potential candidates since the annual incidence of claims for structure damage is difficult to predict.\*

As a more practical basis for projections, critical policies were also analyzed as a sub-group of all policies in force. This relationship ranged from .03% in 1976 to .4% in 1973. Again, the high incidence in 1973 (before the Flood Disaster Protection Act of 1973 became effective) appears to reflect the relatively greater representation of severely flood-prone properties in the NFIP during the early period. Excluding 1973, the average ratio of critical policies to all policies in force has been .11%, ranging from .03 and .04% in years (1976 and 1977) to .2 and .24 in years with relatively higher flood damages (1975, 1978 and 1979).

---

\* To use these relationships for projections, future claims for structure damage to structures not in compliance with NFIP regulations would have to be estimated. (It is assumed that complying structures are not likely to suffer critical damage.)

There seems to be no reliable estimate of the number of residential and non-residential structures in the special flood hazard area. Various estimates have been made, each based on different assumptions.

Based on limited NFIP data, a 1977 study for FIA estimated that there were 4.5 million housing units and 325,000 non-residential structures in the Nation's special flood hazard areas in 1975.\* According to the 1975 Annual Housing Survey 22% of all housing units were structurally deficient. Assuming the same percentage of structurally deficient units among the housing inventory in the special flood hazard area and assuming that structurally deficient units are not covered by flood insurance, the study estimated that only 3.5 million of the 4.5 million housing units in the special flood hazard area (plus all of the 325,000 non-residential structures) were candidates for flood insurance in 1975.

Primarily based on Red Cross data the same study for FIA estimated that from 1970 to 1976 an annual average of 3,950 residential and 3,000 non-residential structures were substantially damaged by flood and hurricanes, representing .09% of the estimated total number of housing units and .92% of the total non-residential inventory in the floodplain. The percentage for the residential inventory is close to the results of the present study but the percentage for non-residential structures is nine times greater.

According to a subsequent estimate prepared directly by FIA, the number of structures in the special flood hazard areas totalled 6.3 million in 1974 and 6.7 million in 1979. This estimate anticipates an increase of 1.5 million structures to a total of 8.2 million structures in the year 2000. It projects that the total number of flood insurance policies will increase to 5.1 million by 2000, i.e. that 3.1 million or 38% of all structures in the special flood hazard area are not expected to be covered by flood insurance.

Reasons for not purchasing flood insurance vary widely. Many properties are not in use and many are structurally deficient. Many owners are unconcerned, uninformed of the hazard, skeptical of the technical calculations in determining the hazard, under-financed, hesitant to spend for insurance outside of normal financial and

---

\* Shaeffer & Roland, Inc., op. cit.

mortgage money channels, do not like any type of insurance, or permanently procrastinate in purchasing insurance.

An analysis of critical policies as a sub-group of all policies in force must distinguish between policies for new structures conforming to the NFIP's floodplain management regulations and policies for pre-existing structures. In theory, conforming structures should not suffer any significant damage from floods with recurrence frequencies of one percent or less. Even though some of them may remain vulnerable to damage from catastrophic floods with extremely low recurrence frequencies, the probability of critical flood damage to a structure conforming to the NFIP's floodplain management regulations is low. As the NFIP matures, and as acquisition under Section 1362 begins to become effective, policies for pre-existing structures will account for a diminishing share of all policies in force.

During the analysis period, however, new structures constituted only an insignificant share of all policies in force. A review of detailed policy data as of the end of April, 1978 revealed that only three percent of all policies in force at that time covered properties qualifying as new construction under the NFIP. Thus, for practical purposes, the data for policies in force during the analysis period represents development not in compliance with the NFIP's floodplain management regulations. Consequently, the historical average annual ratios of critical policies to all policies in force of .11% was used as a basis for projections in connection with estimates of future policies in force for pre-existing and nonconforming floodplain development.

The number of future policies for non-conforming structures was estimated by subtracting FIA's projected estimates of new, insured structures in the floodplain from FIA's estimates of all policies in force. Under the optimistic assumption that by the end of Fiscal Year 1983 all new development in the floodplain will comply with NFIP standards and not be susceptible to critical damage, the number of policies for nonconforming development is still expected to increase by more than one-third, from 1.6 million in 1981 to 2.2 million in the year 2000. If the historical average rate of incidence of approximately .11% for critical policies is applied to these projections, the number of critical policies will rise proportionately from about 1,600 in 1981 to 2,100 in 1990 and 2,200 in the year 2000.

About 80% of all property acquisitions in 1987 or earlier under HUD programs were negotiated. Experience indicates that owners of critical properties will be more willing to sell at fair terms than owners of property affected by general urban renewal and community development programs. It was assumed that 90% of the owners of critical properties would accept Section 1362 acquisition.\* Consequently, barring catastrophic floods, the total program number of critical properties that may be eligible and available for the Section 1362 program would rise from about 1,450 in 1980 to 1,900 in 1990 and 2,000 in the year 2000.

Figure 3 illustrates the projected rate of increase of critical policies in relation to the projected increase of all policies in force. Appendix D presents the detailed projections.

### THREE CONSIDERATIONS AFFECTING THE SCOPE OF CRITICAL PROPERTIES ELIGIBLE FOR ACQUISITION UNDER SECTION 1362

The Section 1362 program can be applied to all critical properties. However, priorities could be established in response to several program considerations. Three of these could significantly affect the scope of the program:

#### Insurance Coverage Requirements

The costs of the 1362 program depend, in part, on the insurance coverage of critical structures. For example, if a critically damaged one-family dwelling is covered by flood insurance up to full replacement value, and if it is totally destroyed by a flood, the owner is entitled to an insurance payment covering the full replacement value.\*\* Thus, the cost of 1362 acquisition would include only the payment for the land, perhaps some relocation expenses plus fees for legal work and appraisals. No payment for residual structure value would be necessary. If the structure is not totally destroyed, but the damage meets the NFIP's recent criteria for constructive total loss, because repair is either prohibited by local authority or permitted but infeasible, the cost of acquisition under Section 1362 would be similarly low.\*\*\*

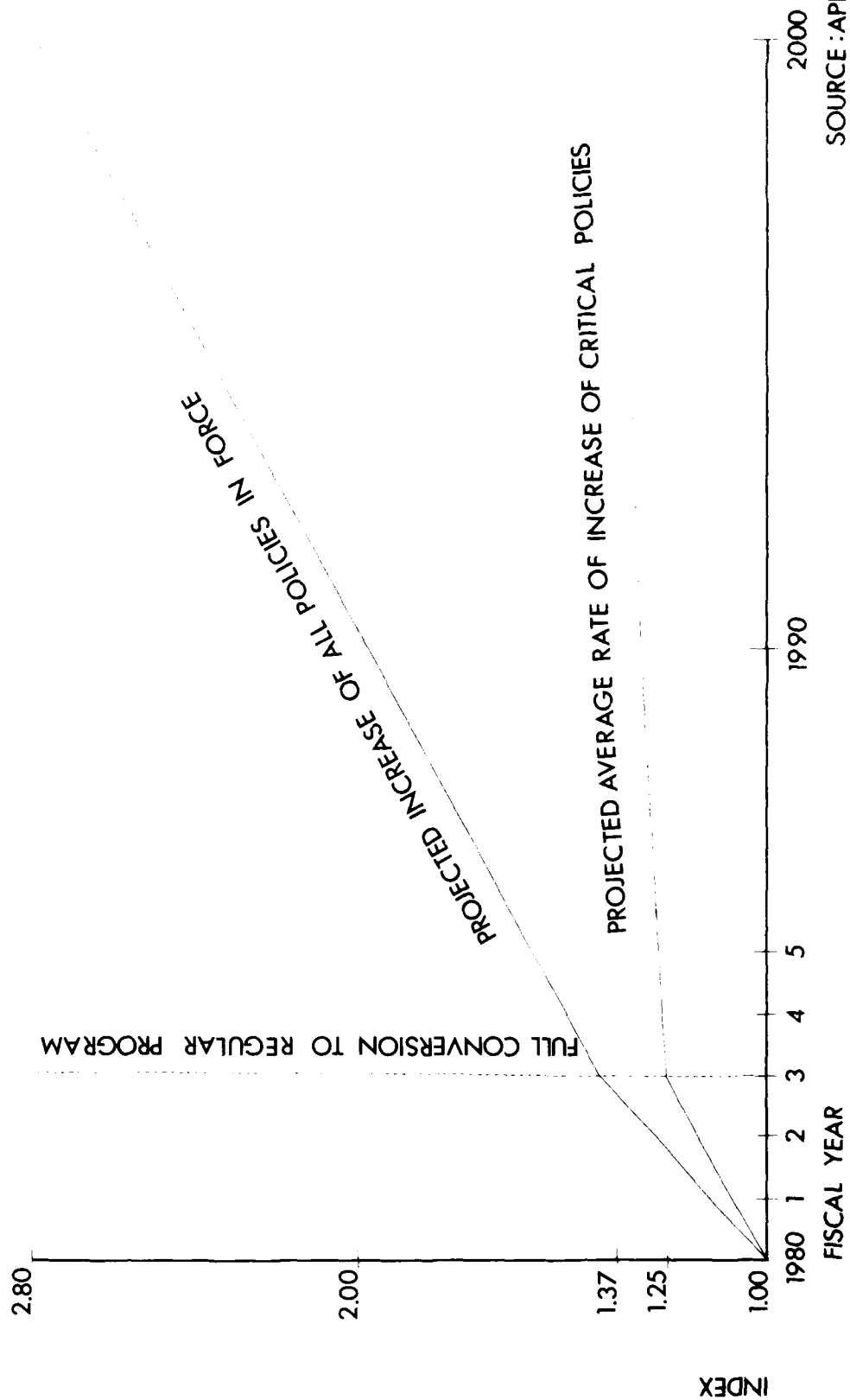
\* Minus the \$200 deductible

\*\* As the actual rate of acceptance of the 1362 program will depend on the owners' perceptions of benefits, it cannot be estimated before the program is implemented.

\*\*\* In this case the National Flood Insurance Fund will bear a higher burden than if the insurance payment covered only the cost of repairs before the flood. However, since the NFIP encourages maximum effective coverage, this burden would signal successful performance of the NFIP.



**FIGURE 3**  
**PROJECTED ANNUAL RATE OF INCREASE OF**  
**CRITICAL POLICIES FROM 1980 THROUGH 2000**



SOURCE : APPENDIX D

Thus, limiting 1362 to properties insured at or above certain levels could lower federal budgetary requirements for Section 1362 and possibly act as an incentive for owners to seek higher coverage.

Two options were considered. In the first, Section 1362 would be limited to properties insured at encouraged levels of coverage. Within the maximum insurance limits for all occupancy types, except one-family homes, insurance up to cash value is encouraged by the NFIP. For one-family homes coverage at or above 80% of full replacement value is encouraged. Under the second option Section 1362 would be applied to critical properties regardless of insurance coverage.

Historically, about one-third of all critical properties were insured at these encouraged levels (20% of one-family structures and more than half of all other properties). As noted, average effective insurance coverage of critical properties is already relatively high. Conceivably existing patterns of coverage can be further improved without rigid measures such as a requirement of minimum coverage for 1362 eligibility. On the other hand, this provision would drastically reduce the scope of properties eligible for Section 1362 and compound the problem of scattered site acquisition.\* Moreover, the federal cost savings per property would not be significant since higher insurance payments would be largely subsidized. Alternative (lower) minimum insurance requirements, however, would contradict existing NFIP policies. Therefore, it appears desirable that eligibility for acquisition under Section 1362 not depend upon minimum insurance coverage.

#### Limitation of Section 1362 to Properties Damaged by Presidentially Declared Major Disasters

Limiting a 1362 program to properties damaged by major declared disasters would have important advantages. First, the delivery of Section 1362 could be combined or "packaged" with federal programs from the Disaster Relief Act of 1974 (PL 93-288) including debris removal (Sec. 403), temporary housing assistance (Sec. 404), individual and family grant assistance (Sec. 408) and the requirement for hazard mitigation actions and procedures (Sec. 406). Secondly, as noted, the analysis of historical critical claims suggests that Section 1362 funds would be more evenly distributed by region.

---

\* For a detailed discussion of this aspect of Section 1362 see Chapter VI.

Two alternative options were considered in regard to this consideration: limit Section 1362 to properties damaged by a Presidentially declared major disaster or exclude Section 1362 from such a restriction.

Historically, only 45% of all critical properties have been damaged by Presidentially declared major disasters. Therefore, if this limitation were to be applied beyond the start-up phase of Section 1362 it could have the adverse effect of diminishing the scope of the program. On the other hand, if Section 1362 was limited to Presidentially declared disasters during its start-up period mechanisms for "packaging" acquisition with other federal relief programs could be more readily explored. Therefore, it appears advisable that Section 1362 be limited to Presidentially declared disasters only during the program's initial implementation phase.

Limitation of Section 1362 to Communities with a Minimum Number of Critical Claims in One Year

As noted, over the entire analysis period only 9% of all communities with critical policies had ten or more incidences and more than two-thirds of all communities had only one or two cases.\* The number of communities with ten or more incidences in one year was even less than 9%. Implementation of Section 1362 in communities with very few eligible properties after a flood event raises questions of administrative efficiency. In addition, the acquisition of one or two isolated properties may make it difficult to arrive at an acceptable reuse, encourage unwise reuse and make the maintenance of acquired properties costly and difficult.

Two alternative options were considered for resolving this question: limit Section 1362 to communities with at least ten critical properties after one flood event\*\* or not impose such a limit on Section 1362.

Historically, 60% of all critical properties were in communities with at least ten incidences in the same year and almost 60% of these properties were in the South. Thus, if this limitation was applied to the program the regional imbalance of critical damage would be further exacerbated.

---

\* It should be noted that with growing enrollment in the NFIP the incidence of critical properties per community will rise. However, the uneven distribution of critical policies per community will not necessarily change. One can expect that there will always be many communities with relatively few critical claims and a small number with a relatively large number of claims.

\*\* The figure 10 was arbitrarily selected.

Furthermore, the results of the community case studies showed that critical damage tends to be scattered, even within areas of relative concentration, indicating that the problem of finding acceptable reasons for properties acquired under Section 1362 also exists in communities with relatively large numbers of critical properties.\* Finally, since communities vary enormously in size this criterion might arbitrarily discriminate against smaller communities. Hence it appears desirable that Section 1362 not be limited to communities with a minimum number of properties after one flood event.

### Synopsis

Figure 4 summarizes the three considerations and their individual and combined effects on the scope of a 1362 program. The most promising options would make a 1362 program available to the full scope of critical properties (Scenario 1).

### CATASTROPHIC FLOOD YEARS

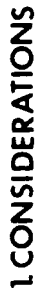
The projected future incidence of critical damage is based on the historical incidence over a relatively "normal" period.\* During years of catastrophic floods critical damage will be far in excess of these levels. As noted in the Introduction, data on national flood losses are limited. The only statistical data series covering an extended period has been compiled by the National Weather Service.\*\* According to this data, damage in catastrophic flood years has been about five times higher than the average in preceding more "normal" years. It is likely that the relationship between the incidence of critical damage in catastrophic flood years and the average incidence of critical damage will follow a similar pattern.

---

\* The analysis period includes 1972, the year of two devastating flood disasters: Hurricane Agnes and the Rapid City Flood. However, few properties were enrolled in the NFIP at that time and the claims data do not reflect these catastrophic events.

\*\* The limitations of this data have long been recognized. See, for example, U.S. Congress, Senate, 89th Congress, Second Session, Committee on Banking and Currency, Insurance and Other Programs for Financial Assistance to Flood Victims, 1966, p. 26. ff

## FIGURE 4



THIS SCENARIO WAS FOUND

INCIDENCE OF PROPERTIES QUALIFYING FOR ACQUISITION UNDER  
SECTION 1362 (b)

The incidence of properties that might qualify for acquisition under Section 1362 (b) was estimated. This Section authorizes federal purchase of insured properties in flood-risk areas following damage by a single incident of any kind, if restoration to the pre-damage condition is legally prohibited or permitted only at significantly increased construction costs. Regardless of special local restrictions against restoring flood prone structures, any flood-insured property in a special hazard area which sustains damage that qualifies it for substantial improvements as a result of a single natural disaster (other than a flood), a fire, explosion or any other casualty is potentially eligible for acquisition under this subsection.

A recently completed study\* on the implementation of alternative substantial improvement definitions estimated the average annual number of structures in the Nation's floodplain to be improved substantially following fires and tornadoes to be 3,994. Of these, 2,774 were residential and 1,170 non-residential. The same study estimated that about 30 percent of the structures were insured. That would indicate approximately 1,200 flood-insured structures annually suffer damage that meets the requirements of Section 1362 (b). However, this estimate could be on the low side because experience shows there is reason to believe that a greater share of the structures will be covered with flood insurance in the future. If the 1,200 properties were added to the properties eligible under Section 1362 (a), the scope of properties eligible for acquisition in FY 1980 would increase from 1,600 to 2,800.

The average cost of acquiring properties under a 1362 (b) program could be substantially different, often higher than the cost of 1362 (a) properties for three major reasons. First, it cannot be assumed that 1362 (b) candidates would exhibit average values substantially below the median, as do critically flood damaged one-family structures. If the average market value of one-family properties eligible under 1362 (b) is equal to the median, it would exceed the average

---

\* Sheaffer & Roland, Inc. op. cit.

value of 1362 (a) properties by about one-half. Second, the extent to which the acquisition cost of 1362 (b) properties would be offset by fire and flood insurance payments cannot be predicted. Third, the share of non-residential properties projected for 1362 (b) is substantially higher (29%) than the non-residential share among critically flood-damaged properties eligible under 1362 (a) (5%).

If used selectively, Section 1362 (b) could, in individual cases, make 1362 (a) acquisition more viable by creating more substantial clusters of properties eligible for acquisition. Most importantly, it could be used to help communities remove less than critically damaged structures from dangerous flood hazard areas such as velocity zones and floodways. Criteria and guidelines for the use of Section 1362 (b) would be established consistent with the recent guidelines for the relocation of dwellings situated in dangerous flood hazard areas.\* For the purposes of this study, Section 1362 (b) acquisition was considered an opportunity for complementary acquisition of critical properties under Section 1362 (a).

---

\* Memorandum by Gloria M. Jimenez, Federal Insurance Administrator, to Regional Directors, Division Directors, Insurance and Hazard Mitigation, November 30, 1979.

#### IV. NATIONAL BENEFITS OF THE SECTION 1362 PROGRAM

Chapter II outlined the potential role of Section 1362 as a desirable measure for nonstructural flood loss reduction through acquisition of flood damaged property and as a pivotal incentive within the National Flood Insurance Program. By serving these purposes the 1362 program can yield a broad range of important benefits to the nation. The purpose of this chapter is to describe and, to the extent possible, quantify the public nature of these benefits.

Congress has lodged Section 1362 in the National Flood Insurance Program; consequently, the public interest to be served by 1362 acquisition must be consistent with the specific context of the NFIP. Congress has further mandated that "the objectives of a flood insurance program...be integrally related to a unified national program for floodplain management"\*, i.e. the framework of national policies combining and integrating the objectives of the National Water Resources Policy and the National Disaster Assistance Policy. The twin objectives of the National Water Resources Policy are national economic development and environmental quality, while the objective of the National Disaster Assistance Policy has been to supplement the disaster assistance efforts of states, local governments and disaster relief organizations.\*\*

Water resources projects governed by the objectives and requirements of the National Water Resources Policy must be planned and evaluated on a case-by-case basis in conformance with the water policy objectives and requirements. Section 1362 is exempt from such evaluations. As noted, any requirement that the benefits and costs of 1362 acquisition be evaluated on a case-by-case basis would be self-defeating. If it is to be effective Section 1362 must be available immediately after flood damage occurs. The delays caused by any meaningful case-by-case benefit/cost analysis would render the program unworkable. On the other hand, a general program-level discussion of the benefits and costs of 1362 within the framework of the overall principles guiding the planning and evaluation of water resources projects

---

\* National Flood Insurance Act of 1968 (PL 90-448), Section 1302 (c)

\*\* U.S. Department of Housing and Urban Development, Federal Disaster Assistance Administration, Digest of Federal Disaster Assistance Programs, August, 1975, p. 1.



can be useful. Such an assessment would demonstrate that floodplain acquisition under Section 1362 is likely to successfully meet traditional water policy objectives as well as national disaster assistance policy objectives and serve a broad range of other national goals, programs and initiatives.

The need for consistent principles, standards and analytical procedures for planning and evaluating water resources projects evolved out of the Flood Control Act of 1936. In this Act Congress declared that benefits of federal projects to whomsoever they may accrue should exceed costs. Official policies, incorporating such principles, standards and procedures, date from the early 1950's.\* Their evolution reflects a gradual shift from an exclusive reliance on structural measures, such as dams, levees and reservoirs, to more balanced approaches including non-structural measures. The Principles and Standards for Planning Water and Related Land Resources were promulgated in their present form in December, 1979.\*\* This document reaffirmed the two traditional objectives - national economic development and environmental quality - and the requirement that the adverse and beneficial effects of projects relevant to these objectives be calculated for four accounts - national economic development, environmental quality, regional economic development and social well-being. In accordance with the President's water policy initiatives of June, 1978 the Principles were complemented by a new manual of procedures for evaluating national economic development benefits and costs.\*\*\* The recent amendments to the Principles and Standards place a new emphasis on water conservation and non-structural solutions.

#### A. NATIONAL ECONOMIC DEVELOPMENT

According to the new manual of procedures for evaluating national economic development benefits and costs, floodplain acquisition projects yield two types of benefits: those associated with the reduction of flooding (inundation reduction benefits) and benefits associated with new uses of floodplain land (location benefits).

---

\* Budget Bureau Circular No. A-47. December 31, 1952.

\*\* U.S. Water Resources Council, "Principles and Standards for Water and Related Land Resources". F.R. 44:72978 (Dec. 14, 1979).

\*\*\* Water Resources Council, "Procedures for Evaluation of National Economic Development (NED) Benefits and Costs in Water Resources Planning (Level C); Final Rule". F.R. 44:72892; (Dec. 14, 1979).

## FUTURE INUNDATION REDUCTION BENEFITS OF SECTION 1362

The principal national economic development benefits stemming from public acquisition of critical properties consist of reducing damage from future inundation. Chief among these is the reduction of "externalized" flood damages, i.e. losses typically borne by taxpayers or firms providing services to activities situated in the floodplain such as utility companies. The most important examples of such losses are flood insurance subsidies, casualty income tax deductions and flood relief costs. It is important to note that, according to the current guidelines, the reduction of flood losses borne by the owners of critical properties - also termed "internalized flood damages" - "shall not be claimed as a benefit of evacuation or relocation because they are already accounted for in the fair market value of floodplain properties".\*

The most significant cost to the national economy associated with critical properties is public compensation of private flood damages through subsidized flood insurance rates. Assuming that the NFIP's actuarial rates reflect the actual average annual risk of flood damage, the difference between the applicable actuarial rates and the subsidized insurance rate of 25 cents per \$100 paid by owners represents this compensation. As noted in Chapter II, most owners of critical properties have not rebuilt their damaged structures in conformance with NFIP regulations and have continued to benefit from subsidized rates. Using NFIP claims data the amount of this cost - or the benefit of eliminating it - can be estimated.

Owners of critical properties have also been able to receive compensation for their private flood losses through casualty income tax deductions. Data on the cost of such deductions to the national economy are not available. However, NFIP data on uninsured property damage does permit the benefit of eliminating this cost through 1362 purchase to be estimated.

Finally, many owners of critical properties have been eligible for flood disaster relief payments. If properties are critically damaged by Presidentially declared major disasters such payments constitute a substantial cost to the federal Treasury. Chief among disaster relief payments is the cost of temporary housing. Other flood relief costs

---

\* Water Resources Council, "Procedures...", op. cit. F.R. 44:72935.

attributable to individual properties include debris clearance, individual and family grant assistance and unemployment compensation. Available data on the average cost of flood relief from 1970 to 1976 were analyzed as a basis for estimating the benefit of eliminating this expenditure through public acquisition of critical properties.

Table 2 shows (in 1979 dollars) the estimated benefits of reducing these three types of externalized future flood damages by purchasing an average, critically damaged single-family home under Section 1362. Elimination of the flood insurance subsidy is by far the most significant benefit. It is important to note that reducing the externalized damage to the contents of critical properties accounts for more than one-third of the total reduction of externalized losses.

Another externalized cost of critical properties is the damage to utility, transportation and communication systems serving areas susceptible to critical damage. While there is no national data for estimating the benefit of reducing this cost, combining Section 1362 with other acquisition programs could, in individual instances, help to eliminate highly vulnerable sections of local infrastructure systems. The resulting benefit could only be estimated for individual acquisition projects.

In addition to reducing externalized future flood damages, a 1362 program will reduce the overhead costs of the National Flood Insurance Program. While the effect on the NFIP's annual administrative cost of a program that would apply, on the average, to less than one in a thousand policies may be negligible, Section 1362 will eliminate two significant types of expenses. First, insurance agents now receive an annual commission amounting to 15% of the premium for critical policies (or \$10.00, whichever is more). The benefit of saving this overhead cost can be calculated at about \$150 for an average critical property. Second, the NFIP's average cost per claim for claims adjustment is \$228. The benefit of eliminating this overhead cost through 1362 acquisition can be estimated at about \$120 per critical policy. Table 2 shows that the total reduction of externalized flood damages and insurance overhead by acquiring an average single-family home through Section 1362 will amount to approximately \$19,000.

TABLE 2

ESTIMATED REDUCTION OF FUTURE INUNDATION DAMAGES OF AN  
AVERAGE SINGLE FAMILY HOME THROUGH 1362 ACQUISITION

-- 1979 VALUES --

REDUCTION OF FUTURE INUNDATION DAMAGES		PRESENT VALUE OF THE REDUCTION OF FUTURE DAMAGE*	
		STRUCTURE	TOTAL
I EXTERNALIZED FLOOD DAMAGES			
.	SUBSIDIZED INSURED FLOOD DAMAGES	\$10,121	\$ 6,521
.	CASUALTY INCOME TAX LOSSES	291	280
.	FLOOD RELIEF COSTS		1,076
II INSURANCE OVERHEAD			
.	REDUCTION OF AGENT'S COMMISSIONS		149
.	REDUCTION OF COST FOR CLAIMS ADJUSTMENT		122
TOTAL REDUCTION OF INUNDATION DAMAGES			\$18,560

\*Discounted at 7 1/8% over 50 years

\*\*This reduction will be realized only if repaired structures that were substantially damaged are not charged actuarial rates. Generally, this is the situation under current NFIP procedures.

Source: Appendix E

It is important to note that these are national average reductions; local variations in the value of properties and in the frequency and magnitude of flooding can significantly change these amounts. In situations of frequent, serious flooding the reductions in expenditures realized by acquisition can be much larger.

#### LOCATION BENEFITS OF SECTION 1362

The new procedures for evaluating national economic development benefits recognize that removing vulnerable urban land uses from the floodplain may yield three types of location benefits: benefits from an income producing new land use not susceptible to flood damage; income from the resale of cleared floodplain land with an encumbered title; and positive economic effects on adjacent lands, such as increases in the market value or property adjacent to new amenities in the floodplain (open space externalities).

Properties acquired under Section 1362 will, in individual cases, produce economic benefits from new land uses. In a Florida resort community studied for this research project the acquisition of critical properties could facilitate new beach access and parking, possibly generating net income. In three other communities that were studied, floodplain land along rivers could be converted to much needed but not income producing urban parks. In most cases, before full reuse benefits can accrue, Section 1362 will have to be complemented by two elements of a comprehensive program: first, funding for the acquisition of properties ineligible under Section 1362 but necessary for a rational reuse plan; and, second, funding for necessary improvements associated with the reuse project. Therefore, although reuse benefits from Section 1362 can be anticipated, depending on local conditions, they cannot be calculated independent of specific reuse projects.

The second location benefit from floodplain acquisition - resale of land with an encumbered title - would only apply if property acquired under Section 1362 is resold. As discussed later in this report, it is advisable for property acquired through Section 1362 to remain in public ownership.

The third location benefit, positive economic benefits to adjacent lands (externalities) reflecting the amenity value

of living near parks or open space is likely to be significant for many acquisition projects funded - in whole or in part - under Section 1362. Such effects can be measured by the projected increase in the market value of property adjacent to the converted floodplain lands. In two riverine case study communities the average value of this benefit per critical property was estimated at about \$1,000 and in a coastal resort at about \$3,000. These estimates were based on the assumption that 1362 acquisition would be complemented by funds for purchasing additional properties as well as for open space improvements. The calculated benefits were, however, limited to the contribution of 1362 acquisition to the overall reuse plan.

#### B. ENVIRONMENTAL QUALITY

The beneficial environmental effects of a flooded property acquisition program can be attributed to the restoration and preservation of compatible land uses in the floodplain. While they cannot be defined in market, monetary terms, they are a central objective of the 1362 program. Specific environmental effects of Section 1362 will depend on the reuse of acquired land. The principal benefit from completed floodplain reuse projects using Section 1362 will be the creation of open space.

In many cases rational reuse plans may require that Section 1362 purchase be complemented by the acquisition of additional properties. In all cases 1362 purchase will have to be complemented by additional funds for improvements. The discussion of environmental benefits in this section assumes that Section 1362 is made available only to communities willing to commit themselves to the planning and implementation of acceptable reuse projects involving the necessary complementary funds.

The estimates of the scope of a 1362 program in Chapter III indicate that an average total of 1,750 structures in some 320 communities\* will be critically damaged in Fiscal Year 1981 and that about 1,600 will be available for negotiated purchase under Section 1362. Although national data on the acreage of critical properties is not available, if it is assumed that the average property encompasses one-sixth

---

\* Historically, there have been 5.4 critical properties per community.

of an acre,\* the total acreage of critical properties to be acquired under Section 1362 during an average flood year is estimated at less than 300 acres. Even though this total may seem small, it has inherent possibilities for expansion. In the four case study communities rational reuse projects would require complementing 1362 (a) acquisition with the purchase of about an equal number of additional floodplain properties. One other program that may help to fund additional acquisition is Section 1362 (b). Thus, the extent of open space to be created through Section 1362 is likely to exceed the acreage of critical properties.

A paramount environmental benefit of open space reuse projects based on the acquisition of flood damaged properties will stem from their location in or near urban areas where open space is most needed. Other notable environmental benefits from the reuse of publicly acquired flooded properties as open space will result from improved local hydrological conditions. Stormwater detention will be increased, obstructions to flood flow will be removed and floodwater storage capacity augmented. Infiltration will increase and runoff decrease if impervious groundcover is reduced, but if open space is paved or surfaces are made impervious, runoff will increase.

The general hydrologic effects of Section 1362 acquisition on upstream areas will be to reduce flood peaks by allowing the flood waters to pass more quickly downstream and to spread over their natural floodplain. The net effect on downstream areas is less predictable, as it will depend on the balance between the removal of obstructions and the increase in storage capacity. The magnitude of these impacts will vary greatly; when only a few structures are involved - as will be the case in most Section 1362 projects - the effects may be difficult to detect.

Other environmental benefits are less predictable. For example, increases in ground water recharge, heightened aesthetic values, water quality improvements, enhanced wildlife habitation, reduced soil erosion and improvements to critical areas such as sand dunes and wetlands will be experienced in certain areas but not in all. These benefits

---

\* This assumption is based on the average size of critically damaged properties in four case study communities.

are dependent upon the specific use to which the acquired land is put and the physical and social needs of the respective area. Some open space uses may yield few benefits while other uses will produce substantial benefits.

#### C. CONTRIBUTIONS TO OTHER NATIONAL GOALS AND PROGRAMS

The previous two sections show that Section 1362 offers substantial benefits for national economic development and the enhancement of environmental quality, the two objectives of the national water resources policy. Indeed, even if only those benefits that can be estimated in dollars are considered it is apparent that Section 1362 acquisition can be justified solely on the basis of its contribution to national water resources policy.

The most important intrinsic national value of the 1362 acquisition program, however, may be its potential for establishing links between different sets of national policies and programs, rather than as a rigid and narrow activity. The following Section discusses the benefits associated with the broader purposes of Section 1362 on two levels: contributions toward other national policy objectives as well as other federal acquisition programs.

#### CONTRIBUTIONS TOWARD OTHER NATIONAL POLICY OBJECTIVES

##### National Disaster Relief Policy

As noted in the introductory chapter, the federal response to floods has two distinct historical roots: structural flood loss reduction and disaster relief. Following the Flood Control Act of 1936 federal programs stressing structural flood loss reduction have been subject to benefit and cost evaluations under the explicit objectives of the emerging national water resources policy. Disaster relief, on the other hand, has been provided with the more flexible intent of supplementing the efforts and available resources of states, local governments and private disaster relief organizations. The need for merging these two aspects of national policy in a unified national program for flood-plain management has been recognized since the mid 1960's. The leading objectives of this reform have been proper coordination between flood loss reduction and disaster relief



activities and a balanced approach to flood loss reduction, including consideration of nonstructural techniques as well as traditional structural flood control works. Section 1362 is one tool for merging these two objectives.

The chief contribution of Section 1362 to the objectives of the national disaster relief policy is in strengthening local efforts to mitigate future flood losses. As noted, after decades of rising federal expenditures for flood disaster relief, flood loss mitigation is now a leading theme of the federal disaster relief program. The best time to introduce corrective measures in the floodplain is in the immediate aftermath of a flood. A principal weakness of most corrective techniques, such as the NFIP's requirement that substantially flood damaged structures be restored in compliance with certain minimum standards, is their reliance on regulation. In the aftermath of floods communities are often unlikely to enforce strict standards unless they can offer an equitable alternative. Section 1362 represents such an alternative and, therefore, strengthens the enforceability of corrective floodplain management regulations while eliminating future flood losses. Thus, in many cases, Section 1362 can help translate flood loss mitigation from an abstract federal requirement to a practical reality. The value of this effect may even exceed its water policy benefits.

#### National Housing Policy

About 95% of all critical properties are residential. Data is not available on how many of these dwellings are used as permanent housing. However, case study research revealed seasonal occupancy of critical dwellings only in a coastal resort community. As noted, four-fifths of all critical properties were located in riverine floodplains. Thus, it appears that most residential critical properties are used as primary residences.

In the National Housing Act of 1949 Congress affirmed the right of every American family to a "decent home and suitable living environment". Despite efforts to achieve this goal, a substantial share of the nation's housing does not meet these standards. Some of the inventory needs to be replaced and some lends itself to upgrading. Properties vulnerable to critical damage generally form part of the latter group. By offering the occupants of such housing a chance to relocate to decent homes outside of the floodplain Section 1362 will contribute toward the national housing goal.

## CONTRIBUTIONS TO OTHER FEDERAL ACQUISITION PROGRAMS

A rationally planned reuse project will, in most cases, require the inclusion of scattered additional properties ineligible for Section 1362 acquisition as well as funds for reuse improvements and maintenance. If used in conjunction with Section 1362, other federal, state or local programs can help to enhance the benefits of the 1362 program. Simultaneously 1362 can contribute to the objectives of these other programs.

To ascertain which other federal programs would be most compatible with 1362, this research project reviewed the existing federal property acquisition programs and their accompanying acquisition processes. The following four groups of programs were found to be particularly valuable for use in conjunction with Section 1362.

- Housing and Urban Development (HUD)
  - Regular Community Development Grants  
(Entitlement and Discretionary)
  - Emergency Community Development Grants
- Interior; Heritage Conservation and Recreation Service (HCRS)
  - Land and Water Conservation Fund (LAWCON)
- Interior; Fish and Wildlife Service
  - Fish Restoration
  - Wildlife Restoration
- Agriculture; Soil Conservation Service (SCS);  
Farmers Home Administration (FmHA)
  - Acquisition authority under Section 73 of the Water  
Resources Development Act of 1974 (PL 93-2511)
  - Watershed Protection
  - Small Flood Control
  - Civil Works - Flood Control
- Army, Corps of Engineers (COE)
  - Same as Agriculture

The following discussion shows how these programs complement acquisition under Section 1362 and, reciprocally, how Section 1362 contributes to their objectives.

#### Regular and Emergency Community Development Block Grants

Block Grants could serve the two main needs of complementary funds: acquisition of additional properties and open space improvements. They could also provide local matching funds if localities are required to share the cost of Section 1362.

Since the Community Development Program is generally oriented toward larger communities (entitlement grants are limited to communities with a population of at least 50,000) and by virtue of the broad range of eligible activities there is strong competition for such funds within communities, Block Grants may not be available in many communities with critical properties. Whenever local conditions permit combining Section 1362 with Block Grant funds the effect will be mutually beneficial: Section 1362 will contribute to the primary objective of the Community Development Program to develop "viable urban communities, by providing decent housing and a suitable living environment and expanding economic opportunities, principally for persons of low and moderate income",\* while the Block Grant program will help achieve the purposes of Section 1362.

#### Heritage Conservation and Recreation Service. Land and Water Conservation Fund (LAWCON)

This program provides a fixed amount of matching funds to each state for up to one-half the cost of acquiring and developing land for recreation projects. States can directly develop projects or make subgrants to communities. In communities where the need for floodplain acquisition coincides with recreation needs recognized under the state's comprehensive outdoor recreation plan, LAWCON grants - combined with the necessary matching funds - could complement 1362 acquisition by funding the purchase of additional properties as well as open space improvements. Properties acquired under Section 1362 can count as part of the local matching fund for LAWCON acquisition.

---

\* PL 93-383, Section 101

Whenever Section 1362 acquisition is "packaged" with the LAWCON program it will help to achieve the LAWCON program's objective of providing financial assistance for acquiring and developing outdoor recreation areas and facilities for the general public. Likewise, the LAWCON program will contribute to the objectives of Section 1362.

#### Fish and Wildlife Service

##### Fish Restoration and Wildlife Restoration

In some instances these two closely related programs, also known as the Dingell-Johnson and Pittman-Robinson bills, may be used in concert with Section 1362. Their principal purpose is to support the restoration or management of fish and wildlife populations; the preservation and improvement of sport fishing and hunting and related uses of fish and wildlife resources; and the provision of facilities and services for conducting hunter safety programs. A primary method of achieving these purposes is the acquisition of fish and wildlife areas or access to such areas.

Federal aid normally accounts for 75% of project costs, although it may go as low as 10%. Each state is given an annual allotment that remains available for two years. The Service cooperates with state fish and game departments in administering the programs. State agencies are responsible for preparing detailed plans for each project to be funded; local communities do not directly participate in the program. The state agency is responsible for managing and maintaining acquired property as well as any development of lands or waters. Project funds may be used for management and maintenance. If funds are used for improvements to lands or waters, the state must control the lands or waters by fee title, lease, easement, or agreement.

Where applicable, Fish and Wildlife funds could complement 1362 acquisition by acquiring property ineligible for Section 1362 (e.g. undeveloped property) and by providing funds for management and restoration. In turn, 1362 acquisition could complement a Fish and Wildlife project by providing access to streams, rivers, and even shores. Again, Section 1362 would contribute to the objectives of these programs as well as benefit from their contributions.

Nonstructural Floodplain Management Programs of the Corps of Engineers (COE) and the Department of Agriculture Soils Conservation Service (SCS) and Farmers Home Administration (FmHA). Authority under Section 73 of the Water Resources Act of 1974

Of all the complementary programs, only the COE and the Department of Agriculture non-structural floodplain acquisition programs have the reduction of flood losses as their main objective. There are three such programs: Soil Conservation Service/Farmers Home Administration; Watershed Protection and Flood Protection; and Nonstructural Acquisition (areawide and local protection). Their purposes and techniques are similar; the major differences are that the program under the Department of Agriculture is restricted to rural areas and upstream watersheds, while the Corps of Engineers has additional jurisdiction over large projects, urban areas and downstream flood protection.

Non-structural floodplain acquisition under these programs has been extremely slow. Only one project (Charles River Basin) has been completed. However, given the emphasis on nonstructural floodplain management measures in the President's recent water policy initiatives, they may be applied more extensively in the future. Indeed, communities requiring larger-scale floodplain acquisition and unable to obtain other grants-in-aid will have to depend upon Section 73 of the Water Resources act of 1974.

A combination of 1362 acquisition with Section 73 could occur in two ways. One possibility is that a community suffering serious flood damage would accept an FIA offer to purchase critical properties with the intent of land-banking them for a reuse project entailing Section 73. Because of the long planning time required for water resources projects, the properties acquired under Section 1362 would have to be managed by the community until all approvals for the larger project were obtained. In the other possibility, a community suffering serious flood damage after the planning for a floodplain acquisition project has begun, could use Section 1362 to strengthen the floodplain acquisition authority under Section 73 by initiating the acquisition process and reducing the cost of the larger project.

Despite the growing emphasis upon non-structural alternatives, the traditional bias of the principal federal water resources programs in favor of structural flood protection persists. Section 1362 will serve as an incentive for enhancing the advantages of floodplain acquisition under Section 73 as an alternative to structural projects.

## V. THE NATIONAL COSTS OF THE 1362 PROGRAM

This chapter presents the national costs of the Section 1362 program on two key levels: the federal budget and the national economic development costs. The main source for estimating these costs was the historical data on critical policies reviewed in Chapter II. As a first step, the program considerations with major effects on the cost of acquiring critical properties were identified. Then, the budget and the national economic development costs were estimated for different combinations of options - termed scenarios - for resolving these considerations.

### A. CONSIDERATIONS AFFECTING THE COST OF ACQUIRING CRITICAL PROPERTIES

The study identified three considerations with major effects on the average cost of acquiring critical properties and evaluated two options for resolving each of them. The overall standard for evaluating the options was acceptability. Three criteria were used for judging acceptability.

#### - ACCEPTABILITY TO INDIVIDUALS

This criterion helped to evaluate what may conventionally be termed the "social" aspect of the program. Since acquisition must be voluntary, the program will be highly dependent on the response of owners. Section 1362 offers owners an opportunity to sell critically damaged properties, thereby lessening future trauma and the cost and disruption of flooding. Owners will judge this opportunity by weighing the perceived benefits and net costs of relocation. Depending on the outcome, owners will accept or reject the program.

#### - ACCEPTABILITY TO COMMUNITIES

The Section 1362 program will similarly depend on how communities compare potential benefits with the costs and responsibilities which they must accept.

#### - ACCEPTABILITY ACCORDING TO NATIONAL POLICIES

This criterion has two facets:

-- CONSISTENCY AND COMPATIBILITY WITH NATIONAL POLICIES

This criterion was used to evaluate options in relation to the Unified National Program for Floodplain Management, the National Flood Insurance Program as well as the Uniform Relocation Act and the National Environmental Protection Act and other relevant national policies.

-- FEDERAL COST-EFFECTIVENESS

This criterion was used to evaluate how individual options satisfy the important federal concerns of limiting outlays and lessening inflation.

Using these criteria the most advisable option(s) for resolving each consideration were identified. In combination, these options define the budget and the national economic development costs of the Section 1362 program that were found most promising by this study.

Relocation Benefits Under the Uniform Relocation and Property Acquisition Policies Act of 1970 ("Uniform Act")

Whether or not relocation benefits under this Act must be paid in connection with Section 1362 will ultimately depend on a legal determination. If benefits must be paid they would consist of the following standard elements:

RELOCATION BENEFITS UNDER THE UNIFORM ACT

TYPE OF EXPENSE	TYPE OF RELOCATEE RESIDENTIAL		BUSINESS
	OWNER	RENTER	
MOVING EXPENSES	X	X	X
REPLACEMENT HOUSING FOR HOME OWNERS	X		
PAYMENTS FOR RENTERS		X	



Based on detailed data on the relocation expenses of the Department of Housing and Urban Development in 1976, relocation benefits for an average critical property in accordance with the Uniform Act were estimated. It was assumed that the regional distribution of residential properties by owner and renter occupancy reflects the distribution of the entire housing inventory and that moving expenses would be lower because of substantial flood damage to the contents of critical structures.\* Given these assumptions, the weighted average moving cost for critical properties to be acquired under Section 1362 is \$950, in 1979 dollars, and the weighted average replacement housing and renter assistance cost is \$12,000 per property.\*\*

The two alternative options considered were that the Uniform Act applies to a 1362 program and that it does not apply. The first alternative would make the program highly acceptable to individuals and communities by conferring significant benefits. These benefits could more than double the federal budget for Section 1362 as well as increase the administrative requirements of the program. This alternative could weaken the incentive for owners to obtain maximum insurance protection against the risk of critical damage and relocation. The second alternative might be less favored by home owners with insufficient flood insurance coverage since their insurance payment might be insufficient to cover the cost of a comparable new home and since there would be no replacement housing payment to bridge the difference. On the other hand, most home owners with full insurance coverage would receive a payment equal to the full replacement cost of the damaged structure and, therefore, would barely feel the difference between implementation of Section 1362 with or without relocation payments.\*\*\*

- 
- \* As reported in Chapter II, contents damage amounted on the average to 60% of contents value.
  - \*\* Average relocation costs vary by agency. The Federal Highway Administration's average housing payment in FY 1975 was \$8,871. Limited experience of a local effort at Kingery West, Illinois was \$10,000. Recent experience of TVA in Southwest Virginia ranged from \$7,000 to \$12,000 per household.
  - \*\*\* In most cases, the only additional benefit they would receive under the Uniform Act is moving expenses. If the market value of the land sold under Section 1362 is substantially lower than the market value of comparable land outside of the floodplain, replacement housing expenses under the Uniform Act would cover the difference. However, regardless of whether the Uniform Act applies, site payments under Section 1362 may more appropriately be based on the cost of flood-free land (see next consideration).

### Basis for Site Payment

Section 1362 serves the public interest by enabling communities to acquire insured, damaged, severely flood prone properties for uses compatible with sound floodplain management and, implicitly, enabling owners of these properties to relocate to areas outside of the floodplain.

As noted, most owners of single-family homes subject to critical damage can insure themselves against flood damage up to the full replacement value of the structure.\* Most owners of all other properties subject to critical damage can insure themselves against flood damage up to cash value, which is expected to be generally equal to or higher than market value. Thus, the NFIP already enables owners of one-family homes to protect themselves against flood loss up to the cost of a comparable new structure and other owners up to the cost of a comparable used structure outside of the floodplain.

Since land is not insured under the NFIP, the main reason for Section 1362 is to enable public purchase of the sites on which critically damaged, insured structures are situated so that owners can use their insurance payments to move out of flood prone areas. Since the public interest will only be served if owners relocate to areas outside of the floodplain, one factor to be considered is whether the land payment under Section 1362 should cover the value of a comparable\*\* site outside of the special flood hazard area or whether it is to be strictly based on the pre-flood market value of the site to be acquired.

In some cases there may be no difference. In the absence of serious flooding, values for comparable properties inside and outside of the special flood hazard area tend to

---

\* After full conversion to the Regular Program in 1983 all single-family properties can be insured up to \$185,000. In the meantime the insurance limit for properties in Emergency Program communities is \$35,000. The estimated average full replacement value of critical structures is (in 1979 dollars) \$26,200.

\*\* Comparable in terms of size, land use and infrastructure.

be similar\* However, in communities with a recent history of flooding, land values in hazard areas may be significantly lower than values in flood free areas. In such communities Section 1362 might only be acceptable to individuals and workable if it enabled owners to afford a site outside of the floodplain. In a third category of communities, notably ocean resorts, the pre-flood market value of severely damaged beach property may be even higher than the value of land outside of the hazard area.

If legally feasible, it appears most advisable for Section 1362 to offer owners a choice between a land payment based on the pre-flood market value of the property to be acquired and a payment based on the cost of a comparable site outside of the floodplain.

#### Federal Share of Acquisition Costs

Determination of the federal share of acquisition costs involves consistency with broader national policies. The President's Water Policy Message of June 6, 1978 called for an equalized 20% local contribution to both structural and non-structural federal flood damage reduction measures. The Cost-Sharing Legislation submitted by the President to Congress on May 16, 1979 confirmed the President's commitment to this policy.

The main purpose of the cost-sharing initiatives has been to reduce the traditional bias of the major federal flood protection programs against non-structural measures.

---

\* Damianos, Demetrios, Virginia Polytechnic Institute and State University, Office of Water Research and Technology, The Influence of Flood Hazards upon Residential Property Values (Ph.D. Dissertation). Reproduced by National Technical Information Service, August, 1975.

Damianos, Demetrios and Leonard A. Shabman, Virginia Polytechnic Institute and State University, Virginia Water Resources Research Center, Land Prices in Flood Hazard Areas: Applying Methods of Land Value Analysis, The Institute, Bulletin 95, April, 1976.

Warnick, Larry James, Analysis of Growth Rates of Residential Land Values on and Near the Regulated Floodplain. Research paper submitted in partial fulfillment of the requirements for the degree of Master of Science, Dept. of Geography, Oregon State University. Williamson Hall, Room 202, Corvallis, Oregon 97331, July, 1977.

The Federal Emergency Management Agency (FEMA) is not subject to the proposed cost-sharing formula and Section 1362 appears exempt from this initiative. Nevertheless, the following two options concerning cost-sharing were analyzed: (1) the federal government bears the full acquisition costs under Section 1362 or (2) it bears 80%, with the communities paying the remaining 20%. The community case studies found that the first option is clearly acceptable to communities while the second option would be problematic. In the immediate aftermath of a flood the financial capacity of communities and states is often strained by emergency expenses. Moreover, business and property tax revenues may be reduced for some time after a flood. For such reasons at least one of the case study communities would not be able to pay 20% of the cost of a 1362 project in the aftermath of a disaster. Even if a community was able and willing to pay 20% of the cost of 1362 acquisition, state law may be an obstacle. For example, one case study revealed a state law limiting annual increases in municipal expenditures, a provision that would tend to restrict the ability of communities to share the costs of a 1362 acquisition project. In most cases the time required for a community to make the funding available would be too long. Based on these findings it appears most advisable that the federal government pay the full cost of acquisition under Section 1362.

#### Basis for Insurance Payments

The basis for insurance payments by the NFIP should be consistent with the policies and practices of the NFIP. Current practice provides for insurance payments only up to damage and makes it difficult for owners of properties suffering critical damage from a single event to comply with NFIP regulations for substantial improvements. If flood damage to such structures amounts to half the market value, the NFIP insurance payment covers half the replacement value or less, depending upon occupancy type and coverage. As a result, repairing substantially damaged structures at variance with NFIP regulations is often the only acceptable choice available to owners.

On the other hand, claims payments to critical properties based on the assumption of total loss - in the terminology of the insurance industry "constructive total loss" -

would be an important incentive for owners to restore critical structures in conformance with NFIP regulations or to sell critical properties, depending on local floodplain management policies. An analysis of the effect on the National Flood Insurance Fund of a policy that would settle all critical claims on the basis of constructive total loss revealed that the total amount of claims payments paid by the Fund would have been only eight percent higher\* if all historical critical claims had been settled on this basis.

The two options considered in this analysis are insurance payments up to damage (current practice) and insurance payments up to constructive total loss, i.e. a payment level which would enable owners of adequately insured structures to comply with NFIP regulations in the typical case that the regulations require reconstruction at higher elevations. Both options are only relevant to individuals and communities if the NFIP changes its present practices and, in accordance with established criteria, requires insurance at actuarial rates after substantial damage. Under this requirement, repair in violation of NFIP regulations would be strongly discouraged. As a result, the first option (insurance payments up to damage) would be clearly unacceptable to both individuals and communities. Moreover, this current practice is inconsistent with the NFIP's corrective requirements for the repair of substantially damaged structures. Conversely, the second option (insurance payments up to constructive total loss) would restore such consistency by helping to eliminate a group of properties which receives about one-fourth of all claims payments. Finally, the current practice of insurance payments up to damage also fails the test of environmental acceptability as it encourages restoring the severely flood damaged structures to their pre-damage condition. Consequently, it appears most advisable that insurance payments to critical properties be based on constructive total loss, provided that such properties cannot be properly restored at their original elevation.

B. THE FEDERAL BUDGET OF SECTION 1362  
AVERAGE COST OF ACQUIRING ELIGIBLE PROPERTIES

Figure 5 displays - by type of occupancy - the 12 alterna-

\* In 1979 dollars, the Fund would have paid \$43 million in addition to the \$519 million it actually paid for claims. A total of \$98 million was paid to critical properties.

# **FIGURE 5** **COST OF ACQUIRING A WEIGHTED AVERAGE** **CRITICAL PROPERTY BY COST SCENARIO**

**A. ALL CRITICAL PROPERTIES (1979 DOLLARS)**

## **1. CONSIDERATIONS**

LEVEL	CONSIDERATION	OPTION											
		1	2	3	4	5	6	7	8	9	10	11	12
a. NATIONAL RELOCATION ASSISTANCE POLICY	WILL RELOCATION BENEFITS UNDER THE UNKNOWN ACT BE PAID?												
	ON WHAT BASIS WILL PAYMENT FOR THE SITE BE MADE?												
b. NFIP	WHAT SHARE OF THE ACQUISITION COST WILL BE PAID BY THE FEDERAL GOVERNMENT?												
	ON WHAT BASIS WILL INSURANCE PAYMENTS BE MADE?												
<b>2. COST SCENARIOS</b>		<b>THIS SCENARIO WAS FOUND MOST PROMISING</b>											
a. N'L FLOOD INS. FUND	<b>SOURCE</b>	12100	19000			12100	19000			12100	19000		
	<b>PAYMENT</b>	(1) PAYMENT OF COST OF DAMAGE (2) PAYMENT OF CONTRIBUTIVE TOTAL LOSS											
b. ACQUISITION FUND	(1) RELOCATION (2) MOVING EXPENSES (3) REPAIRS, REPAIRS AND RENTAL ASSIST	1000	1000										
	(4) RESIDUAL VALUE (5) AFTER PAYMENT OF TO DAMAGE (6) AFTER PAYMENT OF TO TOTAL LOSS (7) ATC	8000	1700			8000	1700			8000	1700		
	(8) MARKET VALUE OF EXCHANGED SITE (9) ADAPTATIONAL COST OF NEW SITE (10) TOTAL PAYMENT TO OWNER (1)+(2)+(3)+(4)+(5)+(6)+(7)+(8)+(9)+(10)	6900	6900			6900	6900			6900	6900		
	(11) APPRAISAL TOTAL (12) TOTAL ACQUISITION COST (1)+(2)+(3)+(4)+(5)+(6)+(7)+(8)+(9)+(10)+(11)+(12)	40700	40700			40700	40700			40700	40700		
<b>3. FEDERAL COST</b>		30000	21100	24000	18500	20400	13500	16100	10800	15900	16900	10800	8000

**B. CRITICAL 1-FAMILY PROPERTIES (1979 DOLLARS)**  
**1. CONSIDERATIONS**

**a. NATIONAL  
RELOCATION  
ASSISTANCE  
POLICY**

**b. NFIP**

COST OF A  
SUITABLE SITE  
OUTSIDE FLOODPLAIN

IN WHAT 8  
RE MADE 3

ON WHAT BASIS WILL INSURANCE PAYMENTS BE MADE?

## 2.COST SCENARIOS

**PAYMENT**

a.N'I FLOOD  
IN'S. FUND

(.) PAYMENT IS TO COVER THE DAMAGE

b. ACQUISITION  
FUND

(1)  $DECTAIOPI$   
(2)  $OMCVRPG$   $EAPR255$   
(3)  $IMPERCMENT$   $MOJIND$ ,  $AND$   $PIPIAL$   $ANST$   
(4)  $REPIVAL$   $VALREPI$   
(5)  $DE$   $AT$   $TR$   $25$   $AMPM$   $10$   $PG$   $RAMM$   
(6)  $DE$   $AT$   $TR$   $07$ ,  $AMPM$   $10$   $PG$   $TRIAL$   $255$   
(7)  $LAND$

(1)  $\Delta \mu$  [0]

2015 12 11 14:30:00 - 14:30:00

THE UNIVERSITY OF CHICAGO

(1) ADDITIONAL COPY OF THE SAME

# WYAT PATIENT "C" PROFILE

(Δ) APPR Δ:  $\zeta_\Delta, \cdot \vdash \{ \zeta, \text{Al}$ 

10.  $\mathcal{A} = \mathcal{A}(\mathcal{A}_1, \mathcal{A}_2)$  and  $\mathcal{B} = \mathcal{B}(\mathcal{B}_1, \mathcal{B}_2)$  are  $\mathcal{A}$ - $\mathcal{B}$  bisimulations.

**WILLIAM K. JENNIFER, JR.**

### 3.FEDERAL COST



tive combinations of options resulting from the four considerations outlined above. These combinations of options are referred to as "cost scenarios". The Figure also shows costs per average critical property estimated at 1979 levels. Each cost scenario involves two sources of payments: the National Flood Insurance Fund, for insurance payments, and the 1362 acquisition fund. Each scenario further provides for two sub-totals: the total payment to the property owner and the total acquisition budget.

The federal share of the cost of acquiring an average critical property under 1362 ranges from \$30,000 in the most expensive scenario to \$8,000 in the least costly one. Table 3 summarizes the range by major type of occupancy and cost scenario. An analysis of the effects of the four major considerations on the average federal acquisition cost revealed that relocation expenses under the Uniform Act would range from 44% to 57% of total costs. The level of insurance payments is the second most significant factor, capable of reducing the average Section 1362 budget by 23% to 40%. A payment to cover the difference between the pre-flood market value of the damaged site and a comparable site outside of the floodplain would amount to up to 26% of the average budget, and cost-sharing would reduce the federal share of the acquisition budget by 20%, regardless of scenario.

#### BUDGET ESTIMATES

The federal budget for the 1362 program was estimated by multiplying the projected average annual incidence of critical properties which may be eligible and available for 1362 acquisition (Chapter II) by the average federal cost of acquiring critical properties, as shown in Figure 9. Figure 6 summarizes the budget estimates for Fiscal Year 1980 to 1985, 1990 and 2,000 for the 12 cost scenarios. Again, these projections reflect the assumption that all new construction in flood hazard areas will comply with NFIP regulations by 1984 and, consequently, a growing share of properties in the NFIP will not be subject to critical damage. The range of budget estimates, \$12 to \$43 million in Fiscal Year 1980, directly corresponds to the range of average acquisition costs by cost scenario. For the cost scenario found most promising by this study (no relocation payment, land payment on the basis of the cost of a suitable site outside of the floodplain, no



TABLE 3  
AVERAGE COST OF ACQUIRING ELIGIBLE PROPERTIES  
BY TYPE OF OCCUPANCY AND COST SCENARIO  
1979 COST LEVELS

TYPE OF OCCUPANCY	COST SCENARIO											
	1	2	3	4	5	6	7	8	9	10	11	12
WEIGHTED AVERAGE	30,000	23,100	24,000	18,500	20,400	13,500	16,300	10,800	16,900	10,000	13,500	8,000
1-FAMILY	30,300	23,300	24,200	18,600	21,100	14,100	16,900	11,300	17,500	10,500	14,000	8,400
MOBILE HOME	19,200	16,700	15,400	13,400	7,700	5,200	6,200	4,200	6,400	3,900	5,100	3,100
2-4 FAMILY	31,700	26,600	25,400	21,300	17,200	12,100	13,800	9,700	14,200	9,100	11,400	7,300
OTHER RESIDENTIAL	47,500	39,500	38,000	31,600	29,900	21,900	23,900	17,500	24,300	16,300	19,400	13,000
ALL OTHER	34,900	23,100	27,900	18,500	35,900	24,100	28,700	19,300	30,100	18,300	24,100	14,600

# **FIGURE 6** **1362 BUDGET ESTIMATES** **BY COST SCENARIO**

1979 DOLLARS

## **1. CONSIDERATIONS**

LEVEL

a. NATIONAL  
RELOCATION  
ASSISTANCE  
POLICY

ON WHAT BASIS WILL THE PAYMENT FOR THE  
SITE BE MADE?

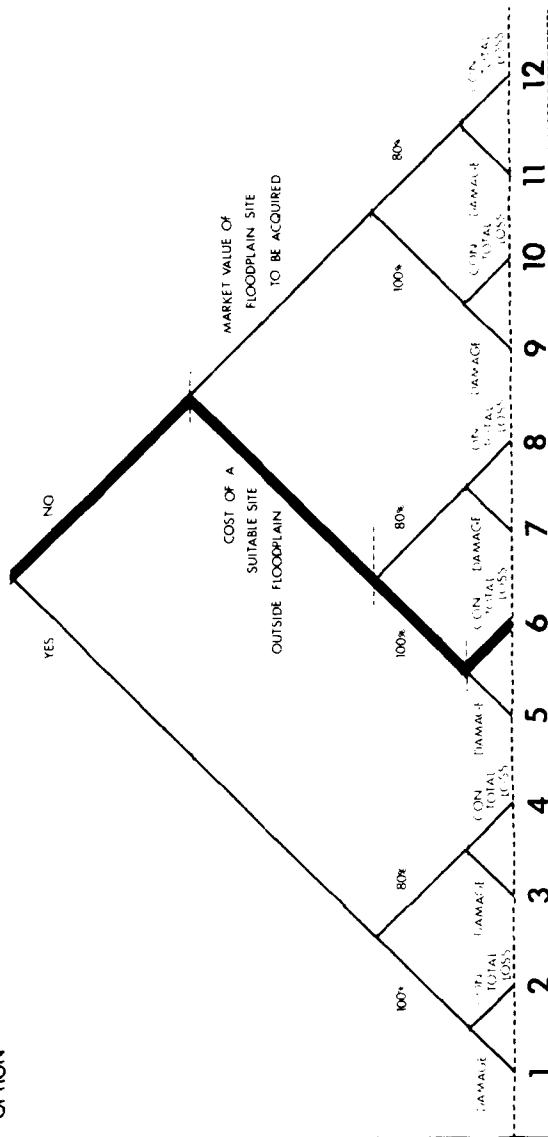
b. NFIP

ON WHAT BASIS WILL THE PAYMENT FOR THE  
SITE BE MADE?

ON WHAT BASIS WILL THE PAYMENT FOR THE  
SITE BE MADE?

ON WHAT BASIS WILL THE PAYMENT FOR THE  
SITE BE MADE?

OPTION



THIS SCENARIO WAS  
FOUND MOST PROMISING

## **2. COST SCENARIOS**

## **3. FEDERAL 1362 BUDGET**

### **SCOPE SCENARIO 1:**

ALL CRITICAL PROPERTIES OWNED BY WILLING SELLERS  
PROJECTION OF CRITICAL PROPERTIES

FISCAL YEAR	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
JAMMAGE TOTAL (US\$)	43	13	35	27	29	20	24	16	16	24	14	20	21	23	24	25	26	27	27	27	27
CORP. DAMAGE TOTAL (US\$)	47	16	38	29	32	21	26	17	17	26	16	21	21	23	24	25	26	27	27	27	27
CORP. DAMAGE TOTAL (US\$)	51	19	41	31	35	23	28	18	18	29	17	23	23	25	26	27	28	29	29	29	29
CORP. DAMAGE TOTAL (US\$)	54	42	43	33	37	24	29	19	19	30	18	24	24	26	27	28	29	30	30	30	30
CORP. DAMAGE TOTAL (US\$)	54	42	44	34	37	24	29	20	20	31	18	24	24	26	27	28	29	30	30	30	30
CORP. DAMAGE TOTAL (US\$)	55	42	44	34	37	24	30	20	20	31	18	24	24	26	27	28	29	30	30	30	30
CORP. DAMAGE TOTAL (US\$)	57	44	45	35	39	26	31	20	20	32	19	26	26	28	29	30	31	32	32	32	32
CORP. DAMAGE TOTAL (US\$)	59	46	47	37	40	27	32	21	21	33	20	27	27	29	30	31	32	33	33	33	33

local cost-sharing requirement and constructive total loss insurance payments) the average annual budget for acquiring all critical properties which may be eligible and available for acquisition is estimated to rise - in 1979 dollars - from \$21 million in Fiscal Year 1981 to \$27 million in the year 2000.

Because the actual annual incidence of critical damage will fluctuate around the projected average annual incidence, the actual budget requirements for the program will exceed the projections in "wet" years and be lower in "drier" years. In accordance with national data on years with catastrophic flood damage, actual budget requirements for Section 1362 acquisition may be five times higher than the projected averages in years of major flood catastrophies.

If acquisition authority under Section 1362 (b) is used only to supplement the acquisition of flooded property under Section 1362 (a), as envisioned by this study, the scope of 1362 (b) purchase may be relatively small and could be accommodated within the projected average annual budget.

#### C. NATIONAL ECONOMIC DEVELOPMENT COSTS

Although Section 1362 is a separate, special program, its principal national economic development costs were also analyzed. Analogous to the concept of national economic development benefits, these costs are calculated regardless of to whom they accrue and, consequently, are not affected by the consideration of cost-sharing or of the level of insurance payments. Again, the recently published manual of procedures for national economic development benefit and cost evaluation served as a guide.\*

The three main national economic development cost categories applicable to the 1362 program are relocation, land and administrative services. Since insurance payments and payments for the residual structure value cover the replacement of critically damaged structures "in kind", relocation benefits for replacement housing and payments covering the difference between the pre-flood market value of the damaged site and the cost of a site outside of the floodplain are considered as improving the housing condition of occupants

---

\* U.S. Water Resources Council. "Procedures...", op. cit.

of critical properties. According to the manual of procedures, such costs count as financial costs for broader purposes rather than national economic development costs strictly related to water resources projects.

Figure 7 shows these national economic development costs by cost scenario as they pertain to the purchase of an average critical single-family home. It illustrates that the only consideration affecting national economic development costs is whether moving expenses are paid. The average cost in scenarios with moving expenses is \$18,000 and in all other scenarios \$17,500. Either cost is lower than the quantified national economic development benefits discussed in Chapter IV.

Section 1362 is a very cost-effective floodplain acquisition program. A major factor is the substantial portion of the critical damage already paid for by flood insurance.

# **FIGURE 7** **NATIONAL ECONOMIC DEVELOPMENT COST OF ACQUIRING AN AVERAGE** **CRITICAL SINGLE FAMILY HOME BY COST SCENARIO**

1979 DOLLARS

## **1. CONSIDERATIONS**

LEVEL	CONSIDERATION	OPTION
a. NATIONAL RELOCATION ASSISTANCE POLICY	WILL RELOCATION BENEFITS UNDER THE UNIFORM ACT BE PAID?	YES NO
	ON WHAT BASIS WILL PAYMENT FOR THE SITE BE MADE?	
b. NFIP	WHAT SHARE OF THE ACQUISITION COST WILL BE PAID BY THE FEDERAL GOVERNMENT?	
	ON WHAT BASIS WILL INSURANCE PAYMENTS BE MADE?	

## **2. COST SCENARIOS**

SOURCE	PAYMENT	1	2	3	4	5	6	7	8	9	10	11	12
a. N'L FLOOD INS. FUND	ADDITIONAL INSURANCE PAYMENT*	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000
b. ACQUISITION FUND	(1) RELOCATION (REPLACEMENT HOUSING, AND RENTAL ASSISTANCE) EXPENSES	600	600	600	600	600	600	600	600	600	600	600	600
	(2) RESIDUAL VALUE (PV)	0**	0**	0**	0**	0**	0**	0**	0**	0**	0**	0**	0**
	(3) LAND	8900	8900	8900	8900	8900	8900	8900	8900	8900	8900	8900	8900
	(4) MARKET VALUE OF FLOODED SITE (b) ADDITIONAL COST OF NEW SITE (a) APPRAISAL/LEGAL	7200	7200	7200	7200	7200	7200	7200	7200	7200	7200	7200	7200
<b>3. NED COST</b>		1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400

\* DIFFERENTIAL BETWEEN CONSTRUCTIVE TOTAL LOSS (19,700) AND PAYMENT BASED ON DAMAGE (12,700)  
 \*\* THIS COST IS OVER AND ABOVE REPLACEMENT IN KIND AND THEREFORE NOT TO BE COUNTED AS NED COST

## VI. EFFECT ON INDIVIDUALS AND COMMUNITIES

### A. INDIVIDUALS

#### BENEFITS

The main individual beneficiaries of the Section 1362 program would be the owners of acquired properties. As noted, if Section 1362 had been in effect since 1970, 6,146 properties would have met the insurance and damage requirements for eligibility. In practice, fewer properties would have been acquired since some owners would have declined to sell and some communities would have declined to accept the acquired properties. From 1981 to 2000 the number of properties owned by willing sellers is estimated to rise from an average of about 1,600 to 2,000 a year.

The principal benefit of the 1362 program to individual property owners would be a payment package enabling them to acquire comparable property outside of the floodplain, thereby ending the cycle of flood damage and disruption. The composition and size of this payment package will depend on the cost scenario chosen for Section 1362 (see Chapter IV) as well as the availability of complementary programs, chiefly concessional SBA loans.

Figure 8 illustrates the benefits to the owner of an average single-family home, assuming no relocation benefits, a land payment covering the value of a fully serviced site outside of the floodplain and an insurance payment based on constructive total loss. The amounts shown for property value, insurance and 1362 settlement closely reflect the national averages for critical single-family homes.\* In addition, the presentation is based on the assumption that the total indebtedness of the average critical single-family property does not exceed its market value. The following main conclusions can be drawn:

- Even without receiving relocation payments, the owner of an average critical single-family home would be compensated at 110% to 120% of the damaged property's market value before the flood if the land payment is

---

\* See Figure 9-b

## FIGURE 8

### THE BENEFITS OF SECTION 1362 TO THE OWNER

#### OF AN AVERAGE SINGLE-FAMILY HOME

##### BEFORE THE FLOOD

In the Fall of 1973, Family A bought a \$7,000 lot with a new \$20,000 ranch house.	Original value of the structure (1973)	\$20,000
In the spring of 1979 it would have cost \$29,200 to build the same house in the same area.	Full replacement value of the structure (spring, 1979)	\$29,200
However, the house had been built in a floodplain and Family A's resources had been used to repair damages from a flood in 1977, rather than for maintenance and improvements. The value of exterior siding, windows, carpeting, mechanical systems and other components had depreciated.	Depreciated replacement value, or "cash value," spring, 1979	\$21,600
In the spring of 1979, Family A tried to sell the property so that they could move to a safer location. Because the area was known for its flood hazard, it was hard to find a buyer. The highest offer was \$28,000 (\$7,000 for the site and \$21,000 for the home), about two-thirds of the value of similar properties outside of the floodplain.	Market value (1979)	\$28,000
	Site	7,000
	Structure	21,000
Family A did not accept this offer because it would not have yielded enough equity for a downpayment on another home. About 90% of the proceeds from the sale would have been needed to retire the two mortgages on the flood-prone property. The first was a 1973 \$21,600 mortgage at 7½% for 30 years with an outstanding principal of \$20,400.	Total debt (1979)	\$25,000

The second was a 1976 \$5,000 SBA loan repayable at 1% over 20 years with an outstanding balance of \$4,600. The combined debt in the spring of 1979 was \$25,000.

As a condition for obtaining the SBA loan in 1976, Family A had purchased flood insurance. The face amount of its policy for the home was \$20,000.

Face amount of insurance for the home \$20,000

## FOLLOWING THE 1979 FLOOD

Damage to the home from a severe flood in 1979 would cost \$15,300 to repair. Because this amount was larger than half the cash value of the structure the property was damaged "substantially beyond repair."

Flood damage to home (1979) \$15,300

Since the face amount of Family A's flood insurance policy was less than 80% of full replacement value of the home, the insurance payment covered only the depreciated value of the repairs.

Insurance payment for damage to the home \$12,700

## IF FAMILY A'S PROPERTY HAD BEEN ACQUIRED UNDER SECTION 1362 IT WOULD HAVE RECEIVED

(Assumptions based on Figure 5, cost scenario 6)

The insurance payment would have been based on the assumption of a total loss.

Insurance face amount or structure cash value, whichever is less, minus \$200 \$19,800

Purchase price of the structure

Any excess of cash value over insurance payment \$1,900

Purchase price of the land

Value of a suitable, fully serviced replacement site \$10,500

---

Total

\$32,200



Deducting the outstanding principal of \$25,000 for the two mortgages from this payment Family A would have an equity of \$7,200 for a downpayment on a new home.

Equity \$7,200

If Family A had been insured at the recommended level of at least 80% of full replacement value its equity might be significantly larger. For example, if the face amount of its insurance policy had been \$29,000 the total payment for the damaged structure would have been \$28,800 and the amount available for a new home would have almost doubled.

Equity if face value of policy was \$29,000 \$14,300

If relocation benefits under the Uniform Act are paid in connection with Section 1362, Family A would have received an additional \$12,800 for moving expenses and for the difference in value between a comparable home outside the floodplain and the purchase price of their property, plus insurance payment for the flooded property. In turn, the purchase price of the land would have been reduced to its market value of \$7,000, rather than the value of a new flood-free site (\$10,500). In sum, Family A's equity would have increased by \$9,300 to \$16,500. At the same time, Family A would have had less incentive to seek higher insurance coverage since the total amount received would be independent of the insurance policy's face value as long as the relocation payment for replacement housing did not exceed \$15,000.

Equity if relocation benefits under Uniform Act are paid \$16,500

Given current interest rates, if Family A were to relocate from the floodplain it would require, in addition to a property settlement under Section 1362, concessional SBA mortgage financing. Such financing is presently available for a primary residence at 5% interest, repayable over up to 30 years, with no downpayment.

AD-A100 441

ABELES SCHWARTZ HAECHKE AND SILVERBLATT INC NEW YORK F/G 5/4  
EVALUATION OF ALTERNATIVE MEANS OF IMPLEMENTING SECTION 1362 OF--ETC(U)  
MAR 81 H-2655

UNCLASSIFIED

FEMA-M/R-4

NL

2 of 2

AD-A  
1034.01




END

DATE

FILED

7-81

DTIC

based on the cost of a comparable site outside of the floodplain. Assuming that the outstanding principal on any mortgages does not exceed the market value of the damaged property before the flood owners will retain sufficient equity to purchase a new home after retiring prior mortgage loans.

- Most importantly, the owner of an average single-family home could double the net proceeds from the sale if the flooded property was insured up to full replacement value. In this case, total benefits without relocation payments would almost equal total benefits with relocation payments under the Uniform Act. In other words, under Section 1362 owners of single-family homes have the option of insuring themselves - within maximum coverage limits - against the cost of relocating from the floodplain after critical damage. If Section 1362 is implemented without relocation payments under the Uniform Act it could become an incentive for owners to seek maximum effective coverage. On the other hand, if relocation benefits under the Uniform Act are paid most owners of critical properties could expect equivalent benefits as a result of public purchase, regardless of insurance coverage. Thus, relocation payments could have the adverse effect of discouraging owners from seeking the highest effective insurance coverage.

Regardless of whether relocation benefits are paid, most owners of critical properties will only be able to enjoy the benefits of Section 1362 and obtain a replacement site if they can obtain a long-term loan. Given current interest rates and the scarcity of mortgage money, the SBA disaster loan program appears to be an almost indispensable complementary ingredient of a successful 1362 program. Owners of flood damaged property who are unable to obtain a permit for repair or reconstruction may qualify for SBA disaster loans up to the full cost of a comparable replacement property outside of the floodplain for a term up to 30 years at a current interest rate of 5% for primary residences and 8½% for second homes.

Use of SBA loans together with Section 1362 could have several important advantages. To date, the SBA has not issued regulations under Executive Order 11988, Floodplain

Management, because it has been unable to determine compliance with technical floodplain management requirements such as base flood elevations. The FIA, on the other hand, is the principal federal agency responsible for defining and enforcing these requirements. In a joint hazard mitigation effort FIA could identify properties eligible under Section 1362 and provide funds for acquisition, as well as delineate areas outside of the floodplain suitable for replacement properties. SBA, on the other hand, could provide willing sellers with low-interest loans to buy replacement properties in areas acceptable to FIA. Recent hazard mitigation efforts in Mississippi and Texas have emphasized that floodplain relocation projects in the immediate aftermath of floods depend on very close coordination between FIA, SBA and other federal and state agencies. Renters of critical properties would benefit from Section 1362 by being compelled to move out of areas of high flood risk. Under the cost scenario considered by this study to be most consistent with the NFIP, Section 1362 would not provide relocation payments. If the program is implemented in accordance with this finding renters will not receive rental assistance and moving expense payments under the Uniform Act. However, other federal programs used in tandem with Section 1362 could help renters move out of dangerous areas. In Presidentially declared disasters renters needing assistance may qualify for Individual and Family Grant Assistance, as well as temporary housing. Renters may also be eligible for SBA disaster loan assistance.

#### COSTS

Owners and renters of acquired properties are likely to incur some costs that are not covered by the net proceeds from insurance and Section 1362. For example, as noted, payment of moving expenses and other relocation costs may be inconsistent with the NFIP and, therefore, unavailable under Section 1362. However, moving expenses are likely to be low because of severe flood damage to personal property. Also, the additional cost of a comparable home outside of the floodplain may be financed with a low interest SBA loan.

The Section 1362 program could also impose some indirect costs on the owners of unacquired properties near sites purchased under the program. For example, if acquisition

caused the population of a floodprone neighborhood to decline, municipal services to the remaining residents might be reduced.

Also, acquisition of scattered properties under 1362 might stimulate states or localities to acquire adjoining properties. (As noted, some communities are likely to "package" 1362 acquisition with other federal programs - or with their own funds - in order to attain manageable reuse sites.) Although 1362 acquisition requires voluntary sale, other programs may permit condemnation. Thus, even though 1362 is itself a voluntary program, its application could stimulate involuntary acquisition under other programs.

#### B. COMMUNITIES

##### BENEFITS

As noted, 1,139 communities had critical properties that would have qualified for Section 1362 acquisition from 1970 through June, 1979. Only 104 of these communities had as many as 10 properties suffering critical damage from a single flood. The number of communities with 10 or more critical properties in one year was even smaller. As some communities with critical properties might have declined to participate in a 1362 program, fewer than 1,139 communities would have obtained severely flood-prone properties during the 1970-1979 period. Assuming an average of 5.5 critical properties per community, the average number of communities with properties qualifying for 1362 acquisition is estimated to rise from about 290 in 1981 to 360 in the year 2000. These communities will benefit directly from Section 1362. However, the communal benefits of Section 1362 will not be limited to the relatively small number of jurisdictions qualifying for acquisition. Certain benefits will accrue to all communities in the flood insurance program.

##### Benefits to All Communities in the NFIP

Communities participating in the NFIP must enact and enforce floodplain management regulations meeting minimum federal standards. The two main purposes of these regulations are to prevent new, unwise development in the floodplain and to correct the rebuilding of existing development that is substantially damaged by flooding. As noted, communities have rarely enforced corrective regulations because the NFIP, as implemented in the past,

only paid to repair damaged, insured properties to their previous conditions rather than for reconstruction outside of the floodplain.

With implementation of Section 1362 (and the recently introduced policy of settling certain claims on the basis of constructive total loss) communities will be able to enforce the corrective regulations without fear of causing hardships. Owners of substantially damaged structures who choose not to accept an offer to sell for a fair price under Section 1362 would no longer have the option of making repairs at variance with floodplain management regulations. If a community chose not to accept 1362 and permitted owners of substantially damaged structures to rebuild at variance with floodplain management regulations, the NFIP could charge actuarial insurance rates, thereby terminating the public subsidy for flood insurance to such properties.

#### Benefits to Communities Directly Participating in an Acquisition Program

Communities with critical properties choosing to participate in a Section 1362 acquisition program can be expected to gain a broad range of local benefits in addition to the general benefits outlined above. Chief among them are the environmental benefits discussed in Chapter IV. Other direct benefits will be derived from the reuse of properties acquired under Section 1362. In some cases the new use will create a new amenity enhancing the life of the community; in other cases a reuse project might help restore original conditions, such as dunes and wetlands, thereby reducing damages to remaining development in the floodplain fringe.

Depending on local conditions, different types of amenities could be planned on land acquired under Section 1362. In one case study community acquired sites could have improved access to public beaches. In another community critical properties along a river could have been reused for a park with trails and picnic areas. A third community envisioned reuse for active recreation and a fourth small vest pocket parks.

A most important additional benefit to participating communities is that in many instances Section 1362 might exert a leveraging effect on local non-structural floodplain management efforts. As noted, most communities will have only a few critical properties; moreover, these properties will tend to be scattered. Therefore, in most instances Section 1362 will only help communities in the first step of non-structural floodplain management through property acquisition by enabling them to purchase some severely damaged properties. Additional steps, such as acquisition of the other properties needed for a meaningful reuse project and paying for reuse improvements, will have to come later. In many cases, these additional steps will require other federal or state programs. Without a start under Section 1362 some communities may never seek these resources. Initiating a floodplain acquisition project through Section 1362 could help develop the necessary local support for this approach to non-structural floodplain management.

#### Upstream/Downstream Communities

A 1362 acquisition project might also yield benefits to neighboring communities. For example, the removal of floodway obstructions could reduce flood losses in upstream areas and the reduction of run-off would benefit downstream communities. Other benefits to surrounding communities might include access to additional open space in the region.

#### COSTS

Communities participating in the 1362 program would incur some direct costs for which the federal government would not reimburse them. Specifically, participating localities would probably have to pay for local administration, demolition, site clearance and property management following acquisition and transfer.

Communities that combine Section 1362 with other federal or state programs in order to acquire properties that are not eligible under Section 1362 are likely to incur additional direct costs. In some cases, however, communities may be able to shift part of their 1362 costs to the other programs.

An often feared indirect local cost of a floodplain acquisition program is the reduction of the community's tax base. This fear, however, appears to have little basis in fact. In the four case study communities 1362 acquisition would have had a beneficial effect on local revenues because the value of the replacement properties that would have been added to the tax base was significantly higher than the value of the damaged properties. Moreover, increases in the value of other properties would have more than offset the loss of taxes from the 1362 acquired properties converted to public ownership. For example, properties adjacent to newly created open space under Section 1362 can be expected to increase in value.

Furthermore, communities often grant tax abatement to owners of flood damaged property. A recent study of flood hazard mitigation in Mississippi found the tax abatements granted to owners of damaged properties in one city reduced local revenues by three percent, while the replacement of 42 structures in the floodway by new homes in flood-free areas would have increased the tax base and local revenues.\*

Public officials in the four case study communities expressed support for a federal program such as Section 1362 and believed that the local benefits of such a program would outweigh local costs, provided that the federal government would not require local cost-sharing of acquisition costs. At least two of the four communities would not have been able to accept the program if they had to pay part of the costs.

---

\* Sheaffer & Roland, 1979, op. cit., p. 9



## VI. THE ADMINISTRATION OF THE 1362 PROGRAM

Previous parts of this report identified several major considerations affecting the cost and the scope of implementing the Section 1362 program. This chapter discusses several additional factors, mainly administrative, that need to be considered in implementing Section 1362 and also presents a preliminary program scenario for Section 1362 embodying the findings of the study.

### A. SOME ADMINISTRATIVE FACTORS TO BE CONSIDERED IN IMPLEMENTING SECTION 1362

#### DEFINITIONS

The efficacy and administrative ease of the 1362 program will in part depend on clear and unambiguous definitions of some key concepts.

#### Concept of Property Value for Determining Critical Damage and Eligibility for Acquisition Under Section 1362

Current NFIP regulations define the threshold for substantial improvements in terms of structure market value. This reference to market value is disconnected from the normal procedures of the NFIP. Consistent with general property insurance practices NFIP adjusters use the depreciated replacement value or cash value of damaged structures in settling insurance claims. As noted, the depreciated replacement value of a structure should equal its market value. The market value of land should account for all locational factors affecting value. In practice, however, the two types of estimates may yield different results, particularly in economically depressed areas.\*

---

\* Depreciated replacement value is one method used for appraising the market value of real estate. Theoretically, this method should be compatible with market values based upon other appraisal methods.

The difference in practice results largely from a difference in purpose: if depreciated replacement value is estimated for insurance purposes, land value is generally ignored. Thus, the effect of depressed land values on the value of improvements is not reflected in the estimate. Market value appraisals, on the other hand, are made for a broad range of purposes and must deal with land and improvements together, reflecting all significant locational attributes.

The community case studies showed that the cash value of affected structures tended to be higher than market value, ranging from 100% to 133%. The overall average ratio of cash value to market value was 117% and, inversely, of market value to cash value 85%.

If these relationships are typical of all critical properties the nationwide scope of properties eligible for acquisition would be greater than if cash value and market value were identical, as was assumed for the purposes of national data analysis in this study. The analysis of historical claims data showed that there would have been about 30% more critical policies - a total of 8,075 - between January 1970 and June 1979 if the value of structures had been defined as 85% of cash value, rather than full cash value. However, it is possible that the relationships between cash value and market value of critical properties in the case study communities are not typical because of the unusually high frequency of severe flooding in some of these communities in recent years.

Thus, if eligibility for Section 1362 was based strictly on market value it would have been impossible to determine how many properties would have qualified for acquisition in the past. Moreover, to determine eligibility once the program is implemented the pre-flood market value of properties with damage likely to exceed a critical threshold would have to be appraised. Such appraisals would be time-consuming, cumbersome and costly, particularly in connection with repetitively damaged structures.

On the other hand, if cash value is used to determine critical damage and eligibility under Section 1362 critical properties can be immediately identified during the claims adjustment process, without additional costly and protracted steps. Since the available evidence suggests that cash value tends to be higher, this approach will probably exclude some borderline cases from the enforcement of substantial improvement regulations as well as from Section 1362 acquisition.

This study considered cash value rather than market value more practical and promising for determining critical damage and eligibility for Section 1362. If this conclusion is applied market value appraisals are only necessary to determine the acquisition price of critical properties. In most cases, such appraisals could be limited to the land.

### Consistency of Flood Damage Criteria Used for Judging Substantial Improvements and Section 1362 Eligibility

This report stresses the close bond between Section 1362 acquisition and the NFIP's requirements governing the reconstruction of substantially flood damaged structures. Partly because the necessary incentives for compliance have been lacking, these requirements have been regularly ignored by communities, individual owners, insurance adjusters and agents.

This evaluation of alternative means for implementing Section 1362 coincides with FIA's review of the NFIP's substantial improvement regulations. Any revision of these regulations should be coordinated with the regulations for a 1362 program.

This study assumed that the Section 1362 eligibility criterion of "damaged substantially beyond repair" is identical with the criterion for flood damage requiring substantial improvements, as defined by NFIP regulations. Since current substantial improvement regulations do not apply to properties with repetitive flood damage meeting the eligibility criteria under Section 1362 (a), the question arises if the substantial improvement regulations should be revised to include these criteria in order to equalize the eligibility threshold for substantial improvements and Section 1362.

If the revised regulations for substantial improvements include the same criteria for critical damage (both single and repetitive events) as Section 1362, owners of repetitively damaged critical structures would have the same incentives to repair their property in conformity with NFIP regulations, or sell under Section 1362, as owners of structures critically damaged by a single flood. As a result, the crucial linkage between NFIP requirements and incentives would be reinforced. Consequently, this alternative would strengthen the consistency of Section 1362 within its national policy context. On the other hand, a legal ruling may be required since structures with a damage-to-value ratio of less than 50% would be subject to the substantial improvement regulations. Conversely, since the regulations for substantial improvements only include a criterion for single-event damage the vital link between Section 1362 and the NFIP's floodplain management regulations seems incomplete.

This study finds it advisable to consider revision of the substantial improvement regulations so as to include the same damage criteria as Section 1362 (a).

#### Definition of "Flood Risk Area"

Because of the likelihood that the flood risk area will include all properties whose acquisition is sensible from a floodplain management viewpoint, and because of its administrative simplicity, it is advisable that this area be defined as the special flood hazard area determined by the NFIP.

#### ACQUISITION OF SCATTERED SITES

As shown in Chapter III critical properties generally are widely distributed. Ninety percent of all communities with critical policies had less than ten properties. Two-thirds of all communities had only one or two\*. Furthermore, even when there are a significant number of critical properties in a community they tend to be scattered over the flood hazard area. Even in the most severely flood-stricken area investigated for this study, insured, critically damaged properties were widely scattered. Even if all uninsured critically damaged properties were included, less than half the structures in this area - some isolated and some in small clusters - would qualify for 1362 acquisition. Acquired parcels would remain interspersed with properties ineligible for acquisition under Section 1362, either because they suffered non-critical damage or because they are vacant.\*\*

Some of the problems of acquiring scattered properties include:

- (1) it may not be possible to find an acceptable reuse for scattered properties;
- (2) there may be pressure on the community to permit unwise uses of scattered properties;

---

\* With growing enrollment in the NFIP the incidence of critical properties per community will rise. However, the uneven distribution of critical properties by community will not necessarily change. One can expect that there will always be many communities with few critical claims and some with a relatively large number.

\*\* In the case of this subdivision, all properties were developed.

- (3) community maintenance of scattered properties is more difficult and costly than for contiguous properties; and
- (4) infrastructure will need to be maintained for occupied properties interspersed with acquired properties

A radical solution to the scattered site problem would be to prevent, by regulation, 1362 funds from being used to acquire properties that cannot be consolidated into a minimum manageable site. State and local agencies would only be permitted to acquire sites of a manageable size. Based on the case study findings and other considerations listed herein this approach would make the program infeasible. The essence of 1362 as now authorized makes the acquisition of scattered properties unavoidable, at least in the interim, until complementary acquisition measures are available.

Rather than erecting safeguards against scattered-site acquisition, an alternative approach would be to capitalize on the potential advantages of this unavoidable eventuality. Among the paramount benefits of scattered-site acquisition are:

- (1) using the acquisition of scattered properties as a catalyst for purchasing additional properties under other local, state or federal programs;
- (2) removing scattered nonconforming uses from the floodway in order to encourage enforcement of regulations in other flood prone locations;
- (3) providing public access to waterfront areas, especially in coastal communities; and
- (4) creating "vest-pocket" parks.

Within the framework of the existing statute it appears most advisable that a Section 1362 program take advantage of scattered-site acquisition. The program might be most successful if it is implemented as the "first step" of more comprehensive non-structural floodplain management efforts in affected communities.

## MOBILE HOMES

Mobile homes have accounted for six percent of all critical properties. More significantly, almost one-third of all claims for structure damage sustained by mobile homes were critical. As mobile homes account for a growing share of the nation's housing inventory their share of critical properties may become more significant.

Mobile homes often have unique land use arrangements. The Manufactured Housing Institute, the trade association of the mobile home industry, estimates that 45% of all mobile homes are located on individual lots and the rest in mobile home communities. When home and site ownership are combined the application of Section 1362 would be the same as for any other one-family dwelling. However, combined home/lot ownership cannot be assumed with mobile homes, even for units on individual sites. With the exception of some recent mobile home subdivisions and planned developments, most units in mobile home communities are installed on rented land. In such cases using Section 1362 to acquire only the home would be meaningless.

This study concluded that it would be advisable to apply Section 1362 to mobile homes only when the home and the site are owned by the same party.

## PLANNING, ACQUISITION AND REUSE

The study examined certain key questions relating to planning for a 1362 project, the acquisition process and reuse requirements.

### Encouragement of Advance Planning for Flooded Property Acquisition

Planning before a flood for property acquisition is desirable for several reasons. It can help expedite the acquisition process, increase the likelihood of sound decisions, identify ways of meeting multiple objectives by combining 1362 with other acquisition programs and also help articulate and embody community development goals.

Specifically, advance planning for acquisition could help to:

- (1) identify properties whose acquisition is desirable, from the perspectives of floodplain management and multiple use as well as to promote community floodplain management, recreation, housing and other objectives;
- (2) identify complementary programs that can be used to purchase properties that are ineligible for 1362 acquisition;
- (3) assign post-disaster responsibilities to local, state and federal agencies;
- (4) identify the appropriate reuse of acquired properties;
- (5) identify relocation measures; and
- (6) establish a local institutional capacity for floodplain acquisition.

Advance planning for acquisition could occur as part of functional plans, such as for parks and recreation. Pre-flood planning for acquisition is common in such plans, although floodplain management often receives insufficient attention. It could also occur as part of flood damage reduction planning by local, state or federal agencies. Thus, the TVA has had considerable experience with planning for acquisition and the Corps of Engineers has also had some experience under Section 73 of the Water Resources Development Act of 1974. Advance planning could take place as part of local community plans. Although prepared by many local governments, community plans rarely provide for acquisition of developed flood prone areas, perhaps because funds have not been available.

The federal government, through requirements as well as modest amounts of technical assistance, provides some encouragement for planning that could be used to guide the acquisition of flood prone property.

Funds for functional planning that may include acquisition of flood prone areas and structures are available under a variety of federal programs, of which the mainstay is the Land and Water Conservation Fund (LAWCON). Others include HUD's Section 701 comprehensive planning program, Community Development Block Grants and Fish and Wildlife Service programs. Technical assistance in planning is provided by the Corps of Engineers through its floodplain management services, which are subject to a variety of restrictions.

FEMA is becoming a major new source of technical assistance for floodplain management planning through the FIA's new Technical Assistance Division. The Division, which bears a major responsibility for FEMA's efforts in hazard mitigation, can help communities to: (1) assess the nature, causes and extent of their flooding problems; and (2) identify the range of possible solutions, (including building codes and building design for floodproofing, structural flood control measures, land use adjustments, subdivision and zoning regulations and temporary or permanent relocation measures), which may be appropriate for specific flooding problems.

The creation of the Technical Assistance Division is an important new opportunity for encouraging and assisting communities in integrating hazard mitigation with local planning efforts and, specifically, in considering floodplain management as part of functional plans.

Conceivably, FIA could require advance planning as a condition of community eligibility for Section 1362. However, such a requirement might severely curtail the use of Section 1362 and foreclose aid to people who might otherwise benefit.

As a more promising alternative to a pre-planning requirement FIA, through its Technical Assistance Division, could disseminate information on 1362 in order to encourage its use in multi-purpose planning and stimulate planning for advance acquisition. Such information could emphasize the importance of advance planning in implementing Section 1362 promptly after flood damage occurs and before it is too late to apply the program. This research project found that communities with experience in floodplain acquisition tend to be convinced of the benefits of advance planning.



Responsibility for Conducting the Actual Property Acquisition,  
Including Appraisals, Title Searches and Negotiations with  
Owners

Perhaps FIA could take responsibility for these tasks, either by assembling its own staff of real estate professionals, contracting with local appraisers and law firms or negotiating interagency agreements with federal agencies experienced in real estate.

However, the case studies and community profiles under this research project suggest that it is desirable to have local government perform as much of the work as possible, with federal post-flood involvement limited to providing technical assistance and reviewing and approving appraisals and title searches. For example, in Clinchport, Virginia, the TVA contracted the administration of all phases of a flooded property purchase program. TVA officials attribute the project's success to the lead role played by the local agency and have used the same procedure in similar acquisition programs in Big Stone Gap and Fort Blackmore, Virginia. Also, in Tulsa, Oklahoma, the Urban Renewal Agency has already undertaken one project that removed damaged structures from the floodplain. Local officials agree that any 1362 program would logically be handled by this agency. The case studies indicate that even small towns may be capable of acquiring properties in a timely and efficient manner. However, many small towns may need extensive technical assistance to start an acquisition project.

Since speed is highly desirable it may be prudent for federal employees or contractors to conduct the acquisition rather than simply provide technical assistance to local government.

Therefore, it appears most advisable that, to the extent feasible, local government should conduct the property acquisition. However, regulations should be flexible enough so that FIA can assume responsibility when necessary.

Initial Title

Literally interpreted, Section 1362 envisions the federal government taking title and subsequently transferring the

property to a state or local agency. As an alternative, direct state or local acquisition might be construed as consistent with the intent of the statute or the statute might be amended to permit direct acquisition by non-federal agencies.

There are precedents for each of these approaches under other programs. Proposed COE policy\* and the plan for acquisition of flooded properties in Baytown, Texas,\*\* require federal acquisition of all properties, followed by transfer of the acquired property to participating localities. TVA practices and LAWCON policy provide for direct local acquisition under federal and/or state supervision. For example, a COE project in Prairie du Chien, Wisconsin, planned prior to the new COE policy, provides for direct local acquisition in accordance with federal guidelines and with federal reimbursement.

In evaluating the two approaches, administrative ease (including both the costs of processing and transfer), cost and speed must be considered. A direct local acquisition will also entail federal administrative costs, the difference in administrative and overall costs between the two approaches should not be overestimated.

Generally, and to the extent permitted by law, direct local (or state) acquisition appears more promising, although federal acquisition should be possible when FIA officials in the field believe it is preferable, for example, if a community lacked the legal authority to acquire certain property or if the local staff did not have the time to perform (or even contract out) the acquisition. In some cases federal acquisition might facilitate preferred reuse restrictions. Since it is unlikely that FIA will be able to anticipate the variety of situations that will arise acquisition regulations should be flexible.

Lease or Conveyance to State or Local Agencies, if the  
Federal Government Takes Initial Title

Leasing, under continuing federal ownership, would impose administrative burdens for which there is no apparent compensation, except perhaps when federal ownership would permit more effective reuse restrictions for particularly vulnerable properties. Most important, officials in case study communities strongly preferred local ownership.

\* Federal Register, Vol. 44, No. 104, p. 30892-30895, May 29, 1979

\*\* Final Environmental Statement, Burnett, Crystal, and Scott Bays Baytown, Texas, Office of the Chief Engineers, Dept. of the Army, Sept. 1976

Since communities will be responsible for managing the acquired property they can be expected to want to own it. This is especially true of acquisition projects in which nearby properties acquired under other programs will be owned by state or local agencies. Thus, in one case study community municipal officials want the title to any property which they would be responsible for managing. In another, officials said that they found long-term leases unfamiliar and unacceptable.

Therefore, it appears most advisable that the ownership of properties acquired under Section 1362 be conveyed to state or local agencies.

#### Reuses of Property Purchased under Section 1362

Section 1362 required that property purchased under its authority must "be used for such purposes as the Secretary may, by regulation, determine to be consistent with sound land management and use in such area." Three approaches for meeting this requirement can be advanced: (1) any use meeting FIA's minimum floodplain management regulations would be permitted, (2) more stringent floodplain management standards would be applied to the reuse of publicly purchased property or (3) reuse would be restricted to preponderantly open space.

Executive Order 11988 requires federal agencies to "minimize the impact of floods on human safety, health and welfare". For some federal programs it may not be practicable to guide all development away from floodplains. For a Section 1362 acquisition program, however, no compromise with hazard reduction objectives appears necessary. The reduction of flood hazards can be accomplished in some cases by strict development standards, although the difficulty of applying them is greater when compared to that of applying and monitoring open space restrictions. The case studies and community profiles suggest that the acceptability of preponderantly open space restrictions could be a positive element in a program of property acquisition. In all four case studies public officials were willing to limit the reuse of the acquired land to open space. Seven of eight profiles of communities with acquisition programs found open space restrictions acceptable to local officials.

- \* The eighth - Hilo, Hawaii - was an urban renewal program allowing elevated redevelopment in the fringes of the hazard area, but retaining open space in the high-risk area.

There are two approaches to defining reuse that is acceptable. Either the administrative procedures for Section 1362 could provide a general definition and require submission of a plan specifying the intended reuse for FIA approval, or the procedures could enumerate a list of acceptable reuses. Open space definitions should satisfy the spirit of the Executive Order on floodplains and not be difficult to administer. Several federal agencies with acquisition programs define acceptable uses by a combination of general definitions, examples of acceptable uses and a requirement for federal approval of plans.

The Corps of Engineers has used the following wording in describing the permitted use of acquired property in Baytown Texas: "Management of the vacated lands will include... green belts, wildlife areas, nature walks, and other uses consistent with the high flooding potential of the area."\* In Prairie du Chien, Wisconsin, the same agency relied on the following phrases: "...manage the floodplain in accordance with regulations that...are acceptable to the Secretary of the Army".

The Department of Interior's Outdoor Recreation Grant-in-Aid Manual includes an extensive but not exhaustive list of the types of eligible uses. An inclusive list of acceptable uses is commonly found in local zoning ordinances. Given the variety of local situations it would be unwise to enumerate all acceptable reuse options.

#### Mechanism for Imposing Restrictions on Reuse

Two situations, each requiring separate consideration, may arise. In the first, Section 1362 is the sole source of funds for acquisition and there are restrictions on the reuse of the acquired properties. In the second, 1362 is combined with other programs that have their own restrictions on reuse.

Where 1362 is the only source of acquisition funds a number of options can be employed to restrict the reuse of acquired properties. Under one option, participating localities could acquire the property and enter into a contractual agreement with FIA. Two related programs that use contractual agreements could serve as models. When purchasing property with funds from the Land and Water Conservation Fund (LAWCON) localities enter into an agreement to retain it in public ownership and to use it only for the purposes specified in the funding application. Secondly, localities participating in flooded property purchase projects funded by the Tennessee

---

\* Final Environmental Statement, Burnett, Crystal, and Scott Bays and Vicinity, Baytown, Texas, Office of the Chief of Engineers, Dept. of the Army, Sept. 1976

Valley Authority (TVA) agree to use the acquired property in compliance with sound floodplain management practices and to obtain approval from TVA before conveying the property.

Under a second option, FIA would acquire the property and convey it to a state or local agency, but provide for reversion in the event of misuse. According to a recently proposed rule\*, this strategy will be used by the Corps when acquisition is part of a nonstructural flood damage reduction project. The Corps planned to use this mechanism for its Baytown, Texas acquisition project.\*\*

Under a third option, FIA could acquire the property and convey it to a state or local agency, but retain a flowage easement. Alternatively, a state or local agency could acquire the property and convey a flowage easement to FIA. In Prairie du Chien, Wisconsin the town will acquire property within a Corps sponsored acquisition project and then convey flowage easements to the Corps.

Under a fourth option, FIA would acquire the property and retain ownership, leasing it to state or local agencies. As a precedent, the Forest Service leases property for a variety of purposes.

Three criteria are paramount in evaluating these options. The first is simplicity of acquisition. For administrative reasons, measures that do not require federal acquisition, but rather permit direct acquisition by state or local agencies are preferable. From this standpoint, a federal-local contract is preferable as it does not require federal acquisition.

The second criterion is the effectiveness of the restriction. The four mechanisms are not equally effective in restricting future uses. Careful judgement will be required to balance the benefits of extra protection against the difficulty and cost of imposing it. This judgement could be made either on a program or case-by-case basis. From the standpoint of effectiveness leases may be preferable. However, they are generally unacceptable to local government and impose administrative burdens on the federal government. Apart from leases, the principal differences in effectiveness among the other three measures are most likely to come into play

---

\* Federal Register, Vol. 44, No. 104, pp. 30892, May 29, 1979

\*\* Final Environmental Statement, Burnett, Crystal, and Scott Bays, Texas, Office of the Chief of Engineers, Dept. of the Army, September 1976

when the local government wants to transfer the acquired property to a third party. In that event, federal rights may be greater under a reversion or easement provision than under a mere contract. There are compensating problems, however. The complexities of state property law could invalidate the apparent additional protections offered by easements and revisions or require substantial legal effort to validate them, with the possibility of different conveyancing language being needed in each state. In any event, enforcement proceedings are likely to be cumbersome. Other techniques, notably disqualifying communities from further participation in the NIFP, may lessen the reliance on enforcing contractual or property rights.

The final criterion is avoidance of excessive restrictions. If conditions change (e.g. as a result of constructing a dam upstream), the original reasons for the open space restrictions may be negated. In such situations it should be possible to relax the restrictions. Requiring property to remain in public ownership could itself be an excessive restriction. However, in open space acquisition projects sponsored by other federal agencies perpetual public ownership does not seem to have been regarded as excessive. If local governments leased acquired property to private parties for open space uses it would presumably be consistent with the purposes of Section 1362.

Evaluating the four options against these three criteria, it appears most advisable that FIA impose contractual restrictions similar to those used by LAWCON and TVA. They would be imposed by means of a federal-local contract obligating the locality to keep the property in public ownership and retain it in a specified use. FIA regulations should retain the option, however, of imposing other types of restrictions where warranted.

For the administrative convenience of both the community and FEMA it will be desirable to avoid a checkerboard pattern of restrictions on contiguous properties when 1362 is combined with other programs. In these packaged projects, FIA should try to "borrow" the restrictions imposed on the contiguous property, if they also meet the needs of Section 1362. Thus, the agency regulating adjacent properties would also restrict the use of properties acquired under Section 1362. There are some limitations on the extent to which restrictions can be borrowed from other programs. For one, the restrictions will need to meet FIA's interpretation of all applicable legal requirements, Section 1362 and the

Executive Order. Moreover, the other agency must be willing to accept responsibility for imposing its restrictions on 1362 acquired properties and there must be no legal impediment.

This approach could be implemented through regulations, interagency agreements, or a Memorandum of Understanding specifying programs whose restrictions are consistent with 1362 acquired properties. Such packaged acquisition projects may proceed chronologically in either of two directions. If the non-1362 program was used first, properties acquired under 1362 could be subject to the neighboring restrictions. If the 1362 acquisition came first, it might shift to the neighboring restrictions at a later date.

#### Steps to Monitor Compliance with Restrictions on Reuse

Three approaches deserve consideration: (1) FIA could conduct periodic field visits; (2) participating local agencies could be required to submit periodic statements in conjunction with their annual reports to FIA; or (3) states could be required to monitor compliance.

Related programs offer a variety of precedents. The Corps visits all projects to monitor compliance with the terms of the local cooperation agreement. The focus of this inspection is usually the operation and maintenance of structural works. There is no evidence that the Corps actively monitors compliance with land use restrictions incorporated in their local cooperation agreements.

TVA has reported difficulty in responding to non-compliance with their land use agreements with local communities. In the outdoor recreation assistance program of LAWCON the state is responsible for monitoring compliance with use restrictions, an extension of the large role the state plays in the other parts of this program.

The most systematic compliance monitoring program identified by this research is conducted by the Department of Interior's Water Bank program. Through periodic flights ground cover is checked against photographs to ensure that wetlands are not drained and planted in violation of Water Bank agreements. The public rewards of uncovering non-compliance are great; annual payments to property owners for preserving wetlands can be stopped immediately.

The NFIP's monitoring program might be adapted to monitor compliance with Section 1362 restrictions. This program includes an annual report and field visits to selected communities. Annual report response rates have been roughly 66%, but the number of visits to communities has been small; 347 visits in FY 1978 among 16,000 participating communities. A recent report by the General Accounting Office (GAO) noted deficiencies in this monitoring system, but none of them should create problems in monitoring compliance with 1362 reuse restrictions.\*

It appears most advisable to monitor compliance with 1362 reuse restrictions by "piggy-backing" on existing NFIP reporting and community evaluation procedures. Because the number of communities participating in Section 1362 is likely to remain relatively small, the additional cost of monitoring compliance by giving special attention to annual reports from participating communities would be modest.

#### Duration of Restrictions

There are two main options: either restrictions should last 40 years, the statutory minimum, or they should be perpetual.

In each case, there could be a provision for relaxing restrictions, with the consent of FIA, in the event that conditions change. Although 40 years would be sufficient to satisfy the statutory minimum, there is no reason to suppose that flood hazards - and the need to protect against them - will disappear by then.

With respect to provisions for changing conditions, it will be hard to defend perpetual restrictions if the conditions requiring the restrictions no longer exist. Similar federal programs restricting the use of floodable or open space lands provide for change with the consent of appropriate officials. In three of the case studies local officials would want to modify the reuse restrictions if conditions changed.

There are some arguments against relaxing restrictions, even in the event of changing conditions: incidental benefits (such as recreation) may persist and local governments may have an incentive to seek structural measures to reduce flood damage. These arguments can be considered on a case-by-case basis in deciding whether or not to relax restrictions.

---

\* Letter report on NFIP, GAO, March 22, 1979



Based on the evidence, it appears most advisable that FIA enact perpetual reuse restrictions that provide for appropriate revision in the event of changed conditions.

#### IMPLEMENTATION

Section 1362 is a modest but complex program. If implemented efficiently and expertly its benefits can far outweigh its costs.

To gain the necessary experience for efficient and expert use of Section 1362, FIA is currently preparing to test and evaluate it during Fiscal Year 1980. The field experience gained during this initial implementation period will offer the best basis for the extended use of the program.

#### B. HOW WOULD THE 1362 PROGRAM WORK? A PROGRAM SCENARIO REFLECTING THE FINDINGS OF THIS STUDY.

This concluding section of the report presents a scenario illustrating how the 1362 program would work in the field if the study findings were implemented. It begins with the federal government's decision to implement Section 1362 and continues through all the major steps before and after a hypothetical flood in a typical community. Of course, this is only one way in which 1362 might work; other program options would yield different scenarios.

#### DISTRIBUTION OF RESPONSIBILITIES AND COSTS

FIA will be responsible for providing all of the funds required to acquire eligible properties as well as technical assistance, including: (1) information and guidance to communities prior to Section 1362 implementation; (2) guidance during each phase of a 1362 project (initial briefing, guidance throughout the process and review of applications); (3) assuming project functions that the participating state or local agency is unable to perform; (4) monitoring compliance with program requirements; and (5) assisting in planning for reuse projects.

The acquisition cost will consist of: (1) an insurance payment, based on constructive total loss and paid out of the National Flood Insurance Fund, and (2) purchase money for the residual value of the home\*, a comparable site outside

---

\* The difference between the cash value of the structure before the flood and the insurance payment.

of the floodplain and the cost of the necessary appraisals and real estate settlement expenses associated with the property purchase.

Communities will bear responsibilities and costs associated with 1362 acquisition, including: (1) the administration of the acquisition program; (2) demolition and clearance of acquired properties; and (3) interim property management. In the case of a Presidential disaster declaration, the Corps of Engineers may include demolition and clearance in its debris removal program.

Communities will also bear responsibilities and costs related to the reuse of 1362 properties. Specifically, communities will have to take all the steps required to plan and obtain funds for an appropriate reuse project. Depending on the type of reuse project, costs for additional actions may include: (1) acquisition of additional properties required for a meaningful reuse project; (2) reuse improvements; and (3) reuse management.

If properly planned, these additional expenditures can create benefits. As ascertained by this study a number of federal programs are available to fund such projects. In the case of federal water resource programs, the community has to pay 20% of the entire project cost. Since the value of 1362 properties in community ownership may count as part of the local share\*, the costs to the community of a properly planned reuse project may be minimal.

Finally, property owners would be responsible for all resettlement costs beyond those borne by the federal, state or local government.

#### ELIGIBILITY REQUIREMENTS

To be eligible for Section 1362 purchase a property must be: (1) covered by flood insurance; (2) damaged either by one flood event in which the damage equals or exceeds 50% of the structure's cash value, or by floods on not less than three previous occasions within five years in which the damage equals or exceeds on the average 25% of the structure's cash value, or by any event meeting the criteria of Section 1362(b); (3) located in an area of special flood hazard; and (4) offered for sale by its owner.

---

\* This assumption will have to be legally supported.

To qualify, a community containing eligible properties must be willing and able to: (1) accept title and restrict reuse according to administrative guidelines; and (2) assume the responsibilities and costs outlined above.

#### IMPLEMENTATION PHASES

Phase 1: After the federal government decides to implement Section 1362, but before initial implementation.

Time

Frame: Assume initial implementation during FY 1980

- a. Federal Insurance Administration (FIA) prepares a program Environmental Impact Statement, if it is deemed necessary.
- b. FIA obtains the staff required to implement the program and makes provisions for technical assistance to localities.
- c. FIA develops and promulgates regulations for the program in conjunction with possible new regulations applying to critical flood damage.\* These regulations will be consistent with each other and include the following key provisions: (1) "substantial improvement" will be defined consistent with both the single event and repetitive thresholds of Section 1362; and (2) constructive total loss payments will be made to critically damaged structures which may not be repaired at their existing elevations. Insurance payments will be disbursed contingent upon proper certification that the repair or reconstruction complies with NFIP and local requirements or is part of a 1362 property transaction.
- d. FIA develops supplemental information and guidance for communities in the form of pamphlets, etc.
- e. Standard contract documents are developed.
- f. Notices of 1362 availability and supplementary guidance are sent to all communities participating in the NFIP.

---

\* Amending current regulations for "substantial improvements".

- g. New forms and instructions for adjusters are developed and distributed.
- h. Necessary changes in data processing procedures are made to determine eligibility based upon repetitive critical damage.
- i. Legal opinions are obtained on unresolved legal issues including relocation, Privacy Act restrictions, and use of 1362 properties as a local share in reuse properties requiring funds under federal water programs.

Phase 2: After FIA notifies communities of 1362 availability, but before a flood occurs

Some communities may decide immediately that they would like to participate in the program and may start developing the necessary program requirements: identifying properties susceptible to critical damage, developing reuse plans and the capacity for project administration and demonstrating necessary legal authorities. FIA's technical assistance would be made available to such communities. In some communities such advance planning might be incorporated into existing floodplain management or contingency planning processes.

Other communities may take only minimal steps to prepare for participation in the 1362 program, probably centering upon establishing the necessary legal authorities. (Program regulations and guidelines will have specified the necessary authorities.)

Most communities will probably do nothing beyond filing the material sent to them by FIA.

Phase 3: Determination of property eligibility following a flood

Time

Frame: Within 4-21 days following the flood

This phase occurs simultaneously with the two following phases.

When an owner of an insured property claims damage an adjuster is assigned, either by an independent insurance agent or directly by FIA. As part of the assignment the adjuster will receive a printout of the current five-year damage record for the policy in question, showing the dates and amounts of flood damage over the five years and the estimated

structure cash value before each damage event.\*

As usual, the adjuster will determine both the cost of the present damage and the cash value of the structure prior to the present damage event. By dividing the cost of damage by the cash value the adjuster will determine single event critical damage. If this test is negative (ratio of damage cost to cash value less than 50%) the adjuster will determine whether the present damage event, in combination with any two previous damage events during the repetitive damage criterion.

In every case of critical damage from single or repetitive events the insurance adjuster, using a standard form, will immediately notify the owner, the local FIA coordinator, the responsible elected official, the state FIA coordinator and the regional FIA office that the NFIP's requirements for substantial improvements apply to any repair or reconstruction and that future flood insurance premiums for the property will be charged at actuarial rates.\*\*

In response to this notification, the regional or state FIA office will offer a technical assistance team to help the local FIA coordinator determine the base flood elevation at the property in question in accordance with the applicable provisions of CFR 44, 60.3. "Floodplain Management Criteria for Floodprone Areas". In case of a Presidentially declared disaster the hazard mitigation team would assume this responsibility. If the base flood elevation is determined to be lower than the lowest floor of the damaged structure (including basement) the claim will be settled as if there had not been any critical damage. In such cases, a review of the data used to determine the areas of special flood hazard in the community should be considered by the regional FIA office.

If the base flood elevation is higher than the lowest floor of the damaged structure, the regional or state FIA office will notify the owner, the local FIA coordinator and the responsible elected official that two alternative courses of action apply: either the damaged structure can be reconstructed at or above the base flood elevation or the damaged property can be acquired under Section 1362. In the first case the insurance claim will be settled on the basis of the cost of elevated reconstruction, and payment will be made contingent upon certification of compliance.

---

\* Any initial damage event covered by a federal disaster loan or grant which may have triggered the requirement to purchase flood insurance under this policy would also be recorded on the printout.

\*\* Provided that flood insurance rate studies have been completed. If not, actuarial rates will be charged upon the completion of such studies.

If necessary, the regional or state FIA office will assist owners in financing the reconstruction alternative under the SBA disaster assistance program. (This alternative course of the scenario is not elaborated here.)

In any event FIA - or, in case of a Presidentially declared disaster, the hazard mitigation team - will again inform the community and owners of the availability of Section 1362 and aid them in choosing between reconstruction and 1362 acquisition.

#### Phase 4: Preliminary discussion and authorization

Time

Frame: 2-7 days after the flood begins

This phase begins with an initial briefing by FIA officials. It ends with the signing of an authorization by local elected officials for FIA to proceed with the pre-acquisition investigations.

In Presidentially declared disasters, FIA officials would participate in the initial briefing for public officials arranged by the FEMA hazard mitigation team. In non-declared disasters FIA would conduct a briefing serving the same purpose. This briefing would be triggered by a request from local officials following the initial FIA notification of the availability of Section 1362.

At the initial briefing community eligibility requirements for Section 1362 will be explained, along with the prospective benefits and costs of local participation. The function and form of the initial authorization would be explained. This document would serve as (1) a formal expression of local interest in participating in Section 1362, (2) an affirmation that the community understands the requirements of a 1362 project and is willing to abide by the regulations if it decides to apply, and (3) as an authorization for FIA to proceed with pre-acquisition investigations. Informal discussions will be held between FIA and local officials.

If no expression of interest and initial authorization is signed the community and owners are notified to proceed with substantial improvement of the existing structures. In this case, future flood insurance for the properties will be based on actuarial rates.

## Phase 5: Formal commitment

Time

Frame: Varies widely based on the number of properties

This phase begins when FIA is authorized to proceed with the pre-acquisition investigation. It ends with FIA approval of an application for Section 1362 funds. These steps may proceed either for individual properties or for a group of properties.

First, the community officially notifies owners of critical properties of the possibility of 1362 acquisition. This may coincide with an informal survey of property owner interest in selling. Subsequently, local officials call a public meeting to explain the possible 1362 project.

Pending the outcome of the public hearing local officials make a formal commitment to acquire 1362 properties. This commitment is in the form of a very brief application form whose contents are listed below.

### Application Contents

- (1) Properties to be acquired
- (2) Agency to accept title
- (3) Agency to manage land
- (4) Agency responsible for enforcing reuse restrictions
- (5) Agency to administer relocation assistance if applicable
- (6) Agency responsible for demolition and site clearance
- (7) Agency administering the project
- (8) Proposed reuse (generalized)
- (9) Checklist of necessary legal authorities
- (10) Answers to checklist on environmental clearance
- (11) Agreements to abide by program regulations
  - Compliance with reuse restriction
  - Compliance with the requirement of voluntary sale

- (12) Agreement to hold the federal government free from any liability
- (13) Agreement to provide the necessary funds for program administration, site clearance (if not performed by the Corps of Engineers) and site management
- (14) Agreement to take the necessary actions for planning and implementing the proposed reuse project
- (15) Agreements with any outside agencies that will be performing required functions; i.e. if county housing authority will administer relocation.

The regional or state FIA office reviews the application and approves it or sends it back for additions and/or corrections.

Phase 6: Project implementation

Time

Frame: Varies widely with number of properties

This phase begins with the drafting of a contract authorizing legal and appraisal work and ends with site clearance or the transfer of title from FIA to the state or local agency. It includes the following steps:

- a. Following approval of the 1362 application a contract authorizing legal and appraisal work is prepared.
- b. Titel abstracts are prepared
- c. The fair market value of eligible sites - and of suitable replacement sites - is appraised by an independent appraiser with review by FIA or some other federal agency.
- d. After appraisals of eligible sites are completed a contract authorizing purchase is drafted and signed by community and FIA representatives.
- e. An offer to purchase eligible sites is made by the community, backed by the contract with FIA and negotiations proceed until a contract is signed.
- f. The title is transferred to FIA and the constructive total loss insurance payment and the 1362 payments are disbursed to individual owners. FIA offers assistance in obtaining SBA loans to finance the gap between owners' equity (after previous mortgages have been retired) and the cost of replacement housing.



g. Site clearance

h. Title transfer: FIA to state or local agency

Phase 7: Reuse planning and implementation

Time

Frame: Varies widely; estimated approximate average:  
up to five years

At the time of acquisition, FIA offers technical assistance for incorporating the acquired properties into a rational reuse project.\*

After the development of a reuse project plan, applications are made by the community to appropriate state or federal agencies to assist funding. Again, FIA offers appropriate technical assistance and determines the compatibility of the project with the reuse restrictions on 1362 properties.

Upon obtaining funding approvals the reuse project is implemented in accordance with the applicable federal or state program. The 1362 properties are incorporated into the reuse project.

Phase 8: Post-project activities

Time

Frame: Simultaneous with Phase 7; if Phase 7 is not completed, indefinite

As part of its annual reporting to FIA the community will report on project status. Should the community leave the NFIP it will submit a similar report to FIA. Reuse restrictions will not be affected by the community leaving the NFIP. If a change in use is contemplated a new plan must be submitted to FIA for approval. Initial administrative procedures would set out criteria for allowing changes (e.g. reducing flood hazard somewhere else) and procedures for the changes. Procedures should be streamlined to the greatest reasonable degree for administrative efficiency and to promote community-federal relations.

## APPENDICES

APPENDIX A

SECTION 1362 OF THE NATIONAL  
FLOOD INSURANCE ACT OF 1968, AS AMENDED

PURCHASE OF CERTAIN INSURED PROPERTIES\*

Sec. 1362 (a). The Secretary may, when he determines that the public interest would be served thereby, enter into negotiations with any owner of real property or interest therein which --

- (1) was located in any flood-risk area, as determined by the Secretary,
- (2) was covered by flood insurance under the flood insurance program authorized under this title, and
- (3) incurred significant flood damage on not less than three previous occasions over a five-year period of time and on each occasion the cost of repair, on the average, equaled or exceeded 25 per centum of the value of the structure at the time of each flood event or was damaged substantially beyond repair by flood while so covered, and may purchase such property or interests therein, for subsequent transfer, by sale, lease, donation, or otherwise, to any State or local agency which enters into an agreement with the Secretary that such property shall, for a period not less than forty years following transfer, be used for only such purposes as the Secretary may, by regulation, determine to be consistent with sound land management and use in such area.

(b). When any real property referred to in paragraphs (1) and (2) of subsection (a) has sustained damage as a result of a single casualty of any nature under such circumstances that a statute, ordinance or regulation precludes its repair or restoration or permits repair or restoration only at a significantly increased construction cost, the Secretary may enter into negotiations with the owner of the property or interest therein for the purchase of such property for the uses and purposes of this section.

(c). Whenever, as a result of damage from any casualty, the repair, reconstruction, or substantial improvement of any single-family dwelling structure located within a regulatory floodway and insured under the flood insurance program is deemed by the Secretary to be made more effective from the standpoint of prudent flood plain management by elevation of the structure so it will not interfere with the flow of water from the base flood within such regulatory floodway, the Secretary is authorized

\* Sec. 704 (b), Housing and Community Development Act of 1977, Public Law 95-128. Approved October 12, 1977 provided for the following amendments of Section 1362:  
(1) by inserting "(a)" after "Sec. 1362.";   
(2) by striking out paragraph (3) and inserting in lieu thereof a new paragraph (3)   
(3) by adding paragraphs (b), (c) and (d)

to make a low-interest loan at a rate of interest of 2 per centum per annum, repayable in ten years to the owner of any such structure for the purpose of so elevating the structure. There is authorized to be appropriated for purposes of implementing this subsection not to exceed \$4,500,000.

(d). The Secretary is authorized to issue such regulations as may be necessary to carry out the purpose of this section.

## APPENDIX B

### ABSTRACT OF TASK REPORTS

#### FEDERAL PROPERTY ACQUISITION FOR THE REDUCTION OF FLOOD LOSSES, December 1977

The report examines Section 1362 as a federal property acquisition program and as a technique for floodplain management. An analysis of federal acquisition programs examines how property acquisition can be used for reducing flood losses and shows eight programs to be most complementary with Section 1362.

Assumptions are made about the operation and application of Section 1362 in order to further evaluate its compatibility with the eight identified acquisition programs, especially their cost-sharing provisions.

Appendices offer full descriptions of the individual programs analyzed in the report.

#### HISTORY OF FEDERAL EXPENDITURES ON PRE-AND POST DISASTER ASSISTANCE, March 1978

Past experience under disaster assistance programs was investigated. Original data from all federal agencies engaged in disaster relief were used to calculate the value of federal flood disaster subsidies by Fiscal Year from 1972 to 1976. At the beginning of that period SBA House Loans accounted for more than one-half the value of all federal disaster related subsidies. With the growth of the flood insurance program during this period, flood insurance subsidies as a share of all federal disaster relief related subsidies grew to more than 45%, while the share of SBA Home Loans shrank to about 10%.

Consequently, the analysis showed that by far the most important economic benefit from 1362 acquisition is reduction of flood insurance subsidies in connection with properties eligible under the program. An additional but much less significant benefit would be the reduction of other disaster relief payments, chiefly temporary housing.

#### ESTIMATION OF FEDERAL COST OF ACQUIRING FLOOD DAMAGED PROPERTIES UNDER SECTION 1362, March 1980

The report evaluates the scope and cost of the Section 1362 program and includes an analysis of federal budget requirements. The key source of information was data on flood insurance claims paid by the National Flood Insurance Program through June, 1979.

During this period, 6,146 flood-insured properties suffered damage that may have qualified for 1362 acquisition, (referred to as "critical damage"). Three-fourths were one-family dwellings; with few exceptions, the rest were other types of residential structures.

On the average, about .1% of all properties with policies in force have suffered critical damage each year since 1974 when the insurance program began to be more broadly established. Less than half the critical claims resulted from Presidentially declared major disasters. Close to 60% of all critical claims were in the few communities with ten or more such cases. The rest was spread over more than 1,000 communities, most of which had only one or two incidences.

One-fifth of all NFIP claim payments during the analysis period went to owners of critical properties. Such properties were generally well insured, with effective coverage (on which insurance can be collected) averaging 93% of depreciated replacement or cash value.

Depending on the level of relocation payments under Section 1362, on federal/local cost-sharing requirements and on whether critical insurance claims are settled on the basis of damage or constructive total loss, the federal cost of acquiring critical properties was estimated to range - in 1979 dollars - from \$8,000 to \$30,000, with \$13,500 as the cost under a middle-of-the-road approach. Assuming that the incidence of critical policies will average .1% of all policies for structures not conforming with the NFIP's floodplain management regulations, the number of properties expected to be eligible and available for 1362 acquisition will rise from about 1,600 in Fiscal Year 1981 to 2,000 in the year 2,000. The federal budget for buying these properties will range from \$12 to \$59 million during the next few years - depending on the options affecting the average acquisition cost.

DETERMINATION OF CONSISTENCY WITH SOUND LAND USE MANAGEMENT IN THE FLOODPLAIN,  
March 1979

This report considers appropriate federal restrictions on the future use of properties acquired and transferred to State or local agencies, pursuant to Section 1362 of the National Flood Insurance Act of 1968. The report is based on research into the legal and administrative requirements of a 1362 acquisition program, environmental concerns, and the practical experience of several communities across the country that have undertaken floodplain acquisition projects.

The report considers three principal aspects of "sound land use management in the floodplain": (1) the substance of restrictions on reuse; (2) the duration of restrictions; and (3) the legal mechanisms for imposing restrictions. For each of these three aspects, a number of options are identified and several objectives are stated. Each of the options is then evaluated against the objectives. The report reaches the following conclusions:

- o Federal restrictions must be imposed on the future use of all properties acquired pursuant to Section 1362.

- o Reuse of any properties acquired pursuant to the program should be limited to plans prepared by state and local agencies for open space and other wise uses approved by FEMA.
- o Restrictions should be perpetual, not limited to 40 years or any specified longer term.
- o Each of several possible legal mechanisms for imposing federal restrictions may be desirable depending upon the particular circumstances.

Appendices present a state survey of communities with floodplain acquisition experience and profiles of eight communities with floodplain acquisition experience.

## APPENDIX C

### BRIEF DESCRIPTIONS OF ACQUISITION PROJECTS

1. Tulsa, Oklahoma. Acquisition by the Tulsa Urban Renewal Authority of 38 structures damaged by floods. Where possible, houses were rehabilitated and moved to non-floodplain areas on Tulsa's north side where they helped establish a redevelopment area.
2. Baytown, Texas. Proposed acquisition by Corps of Engineers of 448 dwellings in a 750 acre area suffering coastal flooding following water and oil extraction-caused subsidence. High-income population at risk; project justified on basis of discontinuing federal insurance subsidies. Cost originally estimated at roughly \$17 million, but almost doubled by inflation during post-authorization period. (1362 profile)
3. Beatrice, Nebraska. Acquisition of 30 properties from the floodplain of the Blue River with city and HUD Community Development Block Grant monies at a cost of \$0.4 million. HUD has contributed funds to a second acquisition project, this time voluntary, which has attracted more floodplain sellers than the town has money to accommodate. (1362 profile)
4. Baltimore County, Maryland. County funded acquisition of 246 structures in 6 watersheds planned at an estimated cost of \$17 million. 120 properties acquired in first 3 years; entire 100 year floodplain acquired in those areas selected for acquisition. Projects coordinated with county capital improvements planning, recreation and open space planning, and land use planning. Building code virtually prohibits any new development within the 100 year floodplain. (1362 profile)
5. Clinchport, Virginia. Voluntary acquisition program entirely funded by TVA and run by the Scott County Redevelopment and Housing Authority. 53 properties acquired by 1979. TVA willing to spend up to \$1.9 million. Great demand for acquired land currently being leased for agriculture. (1362 profile)
6. Hilo, Hawaii. 388 properties acquired in a 310 acre area subject to tsunami (61 lives lost, 100 people injured in 1960). Federal urban renewal and county funds used for the \$9.75 million project. Most vulnerable area kept in open space, with the rest in elevated commercial redevelopment. (1362 profile)



7. Klamath, California. Devastated floodplain closed to reconstruction by county regulation. New town site prepared in cooperation with a major highway relocation nearby.
8. Lilydale, Minnesota. Acquisition by Ramsey County of about 320 acres and relocation of 116 families in the floodway, most occupying mobile homes. \$4.4 million funding primarily from a regional bond issue with some help from the state. Reuse emphasis on public open space and water access. (1362 profile)
9. Prairie du Chien, Wisconsin. Acquisition by town of 130 structures in Corps of Engineers-funded relocation project in 10 year floodplain of Mississippi River. Total cost estimated \$3.95 million with local share to be paid with HUD CDBG funds. (1362 profile)
10. Waterloo, Iowa. Acquisition, renewal, and structural flood control where Corps of Engineers flood control planning was successfully coordinated with urban renewal planning. 534 families were relocated and 167 acres made available for industrial use.
11. Willamette Valley Greenway. A state-local recreation and access oriented program involving both fee simple and less-than-fee acquisition. Some flood damage reduction aspects.
12. Kingery-West Subdivision, Salt Creek Watershed, DuPage County, Illinois. Forest Preserve District of DuPage County acquired 50 repeatedly-flooded residences using a variety of funding sources. Flood damage reduction and recreational objectives met simultaneously.
13. Des Plaines Watershed, Illinois. Soil Conservation Service and Metropolitan Sewer District have developed a flood damage reduction plan including acquisition and relocation of scattered residences. SCS intends to try for funding under Section 73.

14. Big Thompson, Colorado. Acquisition of 123 parcels on almost 50 acres following 1976 flash flood which killed 139 people and caused \$39 million in property damage. The \$2.27 million county program used funds from LaWCON, the Secretary of Interior's discretionary Fund, the Secretary of HUD's discretionary fund, HUD disaster funds, and the Four Corners Regional Commission.
15. Maricopa Wash, Scottsdale, Arizona. Permanent evacuation by town of 50 families in the floodway using urban renewal funds, following rejection of Corps of Engineers' initial channelization proposal. LaWCON funds used to develop a floodplain park.
16. Harris County, Texas. The county purchased 1500 acres of undeveloped floodplain in the Cyprus Creek Watershed for \$2.6 million to initiate a larger project to purchase much of this vulnerable floodplain near Houston before development be used for a variety of nature-oriented recreational purposes. To date funding approaching \$5 million has been secured from the county, the state, SCS, LaWCON, Dept. of Interior discretionary funds, and private corporations and foundations.
17. Soldiers Grove, Wisconsin. The city has begun to acquire its central business district, currently located in the Kickapoo River Floodway, for relocation to an upland site. Partial funding has been obtained from HUD and the Dept. of Interior.

APPENDIX D  
PROJECTION OF CRITICAL POLICIES

END OF FISCAL YEAR	PROJECTED NO. OF POLICIES	NEW INSURED STRUCTURES				PROJECTED POLICIES FOR NON-CONFORMING STRUCTURES	PROJECTED CRITICAL POLICIES		
		CONFORMING		CUMULATIVE	TOTAL		WITH OWNERS WILLING TO SELL	INDEX	
		%	NUMBER						
1	2	3	4	5	6	7	8	9	
1979				130,000					
1980	1,819,000	120,000	70	84,000	214,000	1,605,000	1,445	1,605	1.00
1981	2,065,000	125,000	80	100,000	314,000	1,751,000	1,576	1,751	1.09
1982	2,311,000	127,000	90	114,000	428,000	1,883,000	1,695	1,883	1.17
1983	2,561,000	130,500	100	131,000	559,000	2,002,000	1,802	2,002	1.25
1984	2,707,000	132,000	100	132,000	691,000	2,016,000	1,814	2,016	1.26
1985	2,853,000	133,000	100	133,000	824,000	2,029,000	1,826	2,029	1.27
1990	3,603,000	675,000	100	675,000	1,499,000	2,104,000	1,894	2,104	1.31
2000	5,103,000	1,406,000	100	1,406,000	2,905,000	2,198,000	1,978	2,198	1.37

Sources: Col. 1 FIA, 1978 estimates  
 Col. 2 FIA, 1978 estimates  
 Col. 3 Consultant's estimate, based on assumption on conversion to regular program and on assumption that all new construction in regular program communities will conform to NFIP regulations  
 Col. 4 col. 2 x col. 3  
 Col. 5 For 1979, consultant's estimate, based on NFIP Premium and Coverage Summaries  
 Col. 6 col. 1 minus col. 5  
 Col. 7 col. 6 x .001 (Estimated average incidence of critical damage)  
 Col. 8 Consultant's estimate, based on historical average of HUD data (80 percent of sales in 1975 and 83% in 1976) and on assumption that the average rate of negotiated sales under a program for acquisition of critical properties would be higher than HUD averages.

# APPENDIX E

## ESTIMATED REDUCTION OF INUNDATION DAMAGES OF AN AVERAGE SINGLE-FAMILY HOME THROUGH 1362 ACQUISITION

-- 1979 PRICES --

REDUCTION OF INUNDATION DAMAGES	STRUCTURE Estimated Current Average Rate: \$4.00***/\$100 1	CONTENTS Estimated Current Average Rate: \$8.00***/\$100 2	TOTAL 3
<b>I. EXTERNALIZED FLOOD DAMAGES</b>			
<b>A. SUBSIDIZED INSURED FLOOD DAMAGES</b>			
1. AVERAGE CASH VALUE*	21,605	9,100	
2. AVERAGE EFFECTIVE INSURED VALUE			
a. As a % of Cash Value*	92	68	
b. Amount	19,877	6,188	
3. AVERAGE ANNUAL PREMIUM			
a. Total	795	495	
b. Unsubsidized (Insured Value x \$.25)	50	15	
c. Subsidized (Total minus Unsubsidized)	745	480	
4. PRESENT VALUE OF SUBSIDIZED PREMIUM Discounted at 7 1/8% - 50 years: 13.5856	10,121	6,521	16,642
<b>B. CASUALTY INCOME TAX LOSSES</b>			
1. AVERAGE CASH VALUE*	21,605	9,100	
2. AVERAGE DAMAGE			
a. As a % of Cash Value*	71	60	
b. Amount	15,340	5,460	
3. AVERAGE INSURANCE PAYMENT*	12,663	4,176	
4. AVERAGE DAMAGE NOT COVERED BY INSURANCE			
a. Total (line 2.b minus line 3)	2,677	1,284	
b. Annualized (Multiplied by Current Rate)	107	103	
5. PRESENT VALUE OF DAMAGE NOT COVERED BY INS. Discounted at 7 1/8% - 50 years: 13.5856	1,454	1,399	
6. PRESENT VALUE OF INCOME TAX DEDUCTION Estimated average tax rate: 20%	291	280	571
<b>C. FLOOD RELIEF COSTS</b>			
1. ESTIMATED AVERAGE COST PER HOUSEHOLD OF FLOOD EMERGENCY COSTS IN PRESIDENTIALLY-DECLARED MAJOR DISASTERS**		4,400	
2. PERCENT OF CRITICAL PROPERTIES DAMAGED BY PRESIDENTIALLY-DECLARED MAJOR DISASTERS*		45	
3. ESTIMATED AVERAGE FLOOD EMERGENCY COST PER CRITICAL PROPERTY			
a. Total (4,400 x .45)		1,980	
b. Annualized (Multiplied by Current Rate)		79	
4. PRESENT VALUE OF FLOOD EMERGENCY COSTS Discounted at 7 1/8% - 50 years: 13.5856		1,076	1,076
<b>II. INSURANCE OVERHEAD</b>			
<b>A. REDUCTION OF AGENT'S COMMISSIONS</b>			
1. AVERAGE INSURED VALUE (I.A.2. above)	19,877	6,188	
2. AVERAGE SUBSIDIZED PREMIUM	50	22	
3. AVERAGE AGENT'S COMMISSION (15% of \$72)		11	
4. PRESENT VALUE OF REDUCTION OF COMMISSIONS			149
<b>B. REDUCTION OF COST FOR CLAIMS ADJUSTMENT</b>			
1. AVERAGE COST PER CLAIM FOR ADJUSTMENT			
a. Total****		228	
b. Annualized (Multiplied by Current Rate)		9	
2. PRESENT VALUE OF CLAIMS ADJUSTMENT COSTS			122
<b>TOTAL REDUCTION OF INUNDATION DAMAGES</b>			<b>\$18,560</b>

Sources: \* NFIP claims data analyzed for this study (average for single-family homes)  
 \*\* Data on Federal Disaster relief expenditures analyzed for this study  
 \*\*\* Estimated average actuarial rate of critical properties based on  
 case study research performed for this study  
 \*\*\*\*FIA, 1979

## LITERATURE CITED

Damianos, Demetrios, Virginia Polytechnic Institute and State University, Office of Water Research and Technology, The Influence of Flood Hazards Upon Residential Property Values (Phd.D. Dissertation). Reproduced by National Technical Information Service, August, 1975.

Damianos, Demetrios and Leonard A. Shabman, Virginia Polytechnic Institute and State University, Virginia Water Resources Research Center, Land Prices in Flood Hazard Areas: Applying Methods of Land Value Analysis, The Institute, Bulletin 95, April, 1976.

Kunreuther, Howard. Recovery from Natural Disasters. Insurance or Federal Aid? Washington, D.C. American Enterprise Institute for Public Policy Research. 1973.

Kusler, Jon. Floodplain Acquisition: Issues and Options in Strengthening Federal Policy. Prepared for the President's Committee on Water Policy, c/o U.S. Water Resources Council. October, 1979.

Platt, Rutherford. Options to Improve Federal Nonstructural Response to Floods. Prepared for the President's Committee on Water Policy, c/o U.S. Water Resources Council. December, 1979.

Sheaffer & Roland, Inc. Alternatives for the Implementing of Substantial Improvement Definitions. Prepared for the U.S. Department of Housing and Urban Development, Federal Insurance Administration, Contract No. 4506. January, 1978

\_\_\_\_\_. Evaluation of the Economic, Social and Environmental Effects of Floodplain Regulations. Prepared for the U.S. Department of Housing and Urban Development, Office of Policy Development and Research. February, 1979.

\_\_\_\_\_. Report on Flood Hazard Mitigation in Mississippi. Prepared for the Emergency Management Agency. Federal Insurance Administration, Contract No. H-6879. September, 1979.

U.S. Congress, General Accounting Office, Comptroller General. Report to Congress. National Attempts to Reduce Losses from Floods by Planning for and Controlling the Uses of Flood Prone Lands. U.S. General Accounting Office. March 7, 1975.

U.S. Congress, Senate. 89th Congress, Second Session. Committee on Banking and Currency. Insurance and Other Programs for Financial Assistance to Flood Victims. A Report from the Secretary of the Department of Housing and Urban Development to the President, as Required by the Southeast Hurricane Disaster Relief Act of 1965. 1966.

United States Congress, Senate. 93rd Congress, First Session. Committee on Banking, Housing and Urban Affairs. Flood Insurance and Disaster Assistance. Hearings before Sub-committee on Housing and Urban Affairs on S 269, S 390, S 1495, S 1840 and S 1889. 1973.

U.S. Dept. of the Army, Corps of Engineers. Office of the Chief of Engineers. Final Environmental Statement, Burnett Crystal and Scotts Bays, Baytown, Texas. September, 1976.

U.S. Department of the Army, Corps of Engineers, St. Paul District. Development of Nonstructural Alternatives. May, 1979.

U.S. President. House Document 465: A Unified National Program for Managing Flood Losses. U.S. Congress, House of Representatives. 89th Congress, 2nd Session. August 10, 1966.

U.S. Water Resources Council. "Water and Related Land Resources. Establishment of Principles and Standards for Planning. Federal Register. Vol. 44, p. 72978

\_\_\_\_\_. "Procedures for Evaluation of National Economic Development (NED) Benefits and Costs in Water Resources Planning (Level C); Final Rule." Federal Register. Vol. 44, p. 72892

\_\_\_\_\_. A Unified National Program for Flood Plain Management. September, 1979.

Warnick, Larry James, Analysis of Growth Rates of Residential Land Values on and Near the Regulated Floodplain. Research paper submitted in partial fulfillment of the requirements for the degree of Master of Science, Dept. of Geography, Oregon State University. Williamson Hall, Room 202, Corvallis, Oregon 97331, July, 1977.